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Acceptability and feasibility of using co-production to develop an intervention for final year student nurses, to support retention in the transition to qualified practice

By

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List of Abbreviations

ACT	Acceptance and Commitment Training
BERA	British Education Research Association
BSc	Bachelor of Science Degree
CFIR	Consolidated Framework for Implementation Research
COREQ	Consolidated Criteria for Reporting Qualitative Research
CRedit	Contributor Roles Taxonomy
DH	Department of Health
DPA	Data Protection Act
EU	European Union
GDPR	General Data Protection Regulations
HEI	Higher Education Institute
IQR	Inter-quartile Range
IRAS	Integrated Research Application System
ISD Scotland	Information Services Division Scotland
NEXT study	Nurse Early Exit Study
NHS	National Health Service
NHSE&I	National Health Service England and Innovation
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health Research
NMC	Nursing and Midwifery Council
PGdip	Post-Graduate Diploma
PhD	Doctor of Philosophy
PICO	Patient Intervention Comparison Outcome model
PRISMA	Preferred reporting items for systematic reviews and meta-analysis
R&D	Research and Development
RCT	Randomised controlled Trial
TFA	Theoretical Framework of Acceptability
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

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Abstract

The retention of nurses, particularly those in their first year of practice after qualification, is a global concern. The forecast deficit of nurses in the workforce over the forthcoming decade has the potential to impact on patient safety and patient experience.

The aim of this explanatory sequential, mixed methods, two-phase study was to explore the feasibility and acceptability of co-producing and implementing an intervention to increase retention of early career nurses. The study was conducted across a university and a large inner London hospital NHS Trust.

Initially two systematic reviews were conducted, to identify the components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses. Interventions implemented both prior to and after qualification were reviewed. Findings from these reviews indicated that beneficial interventions implemented during educational programmes included elements of preceptorship, exposed students to the reality of the clinical environment, and involved collaboration between the academic and clinical institutions. Consideration should be given to whether there is added value to implementing interventions during the undergraduate period if there are established and well-evaluated strategies already in place in the first few months following graduation. For interventions implemented in the post-graduation period, those incorporating internship/residency programmes and orientation/transition to practice programmes, lasting between 27-52 weeks, with inclusion of a teaching and preceptor and mentor component had beneficial impacts on retention.

Phase 1 involved co-production of an intervention with early career nurses and student nurses and evaluation of the acceptability of the process. The co-produced intervention consisted of four additional days of interactive content to be delivered during the final year of the nursing programmes. Acceptability of the process was evaluated from the perspectives of the group members and facilitators using questionnaires, analysis of reflective facilitator field notes, and semi-structured interviews. The process was perceived as generally acceptable and increasingly acceptable over time. Participants developed

transferrable communication skills, felt an increased sense of wellbeing, and enjoyed using the group as a reflective space. Facilitators were aware of navigating tensions between individual benefit and study outputs but recognised that they gained personally from engaging with the process.

Phase 2 aimed to implement the co-produced intervention and evaluate acceptability and feasibility to inform wider implementation. Seventy-four students participated, and 7 academics were involved in the delivery of the intervention. Pre- and post- acceptability questionnaires, semi-structured interviews, focus groups and reflective field notes were analysed to explore acceptability and feasibility. The intervention was perceived as generally acceptable with significant positive increases in acceptability scores over time. Students perceived the intervention equipped them with skills and experience that offered enduring personal benefit. Pressures in the practice and academic environments presented challenges with attendance. The personal benefits that participants reported align with known protective factors against burnout and leaving the profession.

The systematic reviews and findings from both phases of the study offer new knowledge in relation to co-production across clinical and academic settings, and the design and implementation of interventions to increase retention of early career nurses. Wider implementation of the intervention requires planning to take account of differences in higher education and healthcare organisational culture, and the processes that would empower student and early career nurses to make informed career decisions.

Chapter 1 Introduction

1.1 Background

A strong health workforce is one of the building blocks of an effective health system (World Health Organization (WHO), 2017) and consequently the retention of nurses is both a national and global priority. Nurses leaving either their post or the profession (turnover) is a significant drain on healthcare resources as the resulting deficit of qualified practitioners has the potential to impact on patient safety and patient experience (Francis, 2013). The magnitude and impact of nurse turnover has been discussed extensively in the nursing literature as it is affecting many countries' ability to fight disease and improve health. Although most severe in countries with less developed healthcare systems such as Sub-Saharan Africa (WHO, 2006), high turnover is also prevalent in countries with developed healthcare systems. Some examples include the United States of America (USA), where a survey of 221 organisations in 2020 indicated bedside registered nurse turnover averaged 15.9%, with an annual hospital financial loss of \$3.6M - \$6.1M per hospital and 80% of hospitals reporting a registered nurse vacancy rate greater than 5% (Nursing Solutions Inc. 2020). By 2024, the USA Bureau of Labour Statistics predicts a shortfall of 1.13M registered nurses. Health Workforce Australia (2014) predicted a shortfall of approximately 85,000 nurses by 2025 and 123,000 nurses by 2030 due to demand significantly exceeding supply in the short to medium term. In 2019 some hospitals had an annual turnover as high as 30% of nurses (Parliament of Australia, 2019). In Europe the workforce crisis is exacerbated by nursing shortages in most countries, a situation extensively explored by the European NEXT (Nurses Early Exit) -study (Hasselhorn, et al., 2003). In addition, the Registered Nurse Forecasting (RN4CAST) project indicated that 20-50% of nurses intended to leave their jobs across a sample of eight countries including Belgium, France, Germany, Greece, Ireland, Poland, Spain, and Switzerland. This has significant impacts on the provision of safe patient care and patient mortality rates (Zander, et al., 2016).

In the UK, there were 44,000 nursing and midwifery vacancies advertised in England in May 2019 (1 in 10 posts) and, with increased demands on the NHS due to population growth, a projected shortfall of 250,000 healthcare staff by 2030 (Rolevicz and Palmer, 2019). Across the country there is geographical and specialty variation with nursing vacancies higher in the

southeast (9-12%) and lower in the northeast of the country (4%). The number of community nurses has declined by 37% since 2009 due to staffing shortages, learning disability nurses have declined 42% in the same period and there has been a 1% rise per year of adult nurses. Turnover of nurses across England in 2017-18 was around 20%, with in some areas 1 in 5 nurses leaving their post (Buchan, et al., 2019).

In Scotland, the vacancy rate is 6.5% (ISD Scotland, 2019) and this shortfall of nurses has resulted in greater spend on temporary nurses, impacting on budgets (Audit Scotland, 2017). A similar picture is emerging in Wales and Northern Ireland (Royal College of Nursing, 2019; 2020). This situation is exacerbated by the decision of the UK Government to leave the European Union (EU). Although the number of nurses trained in the UK and registered on the Nursing and Midwifery register to work rose slightly by 0.85% between April and September 2019, the number of nurses joining the register from the EU continued to decline by 3.21% in the same period (NMC, 2019). This compounded a dramatic drop of 89% between 2016 and 2017 (NMC, 2017). Consequently, the retention of nurses in the workforce has become central to national health policy (Buchan, et al., 2019), with particular scrutiny of the effectiveness of interventions to both reduce turnover of nurses between organisations and increase retention of nurses in the profession (Mbemba, et al., 2013; The Association of UK University Hospitals, 2017). In England, this led to a national nurse retention initiative to secure a sustainable NHS workforce for the future (NHS Improvement, 2017).

Many vacancies in the nurse workforce ultimately leads to a lower nurse to patient ratio and there has been continuing speculation about the impact this has on quality of care, patient safety and mortality rates. The relationship is not simple and historically, much of the evidence has been derived from aggregated hospital data, which fails to identify the nuances of the ward context. However, there is compelling evidence that lower nurse to patient ratios lead to omissions in nursing care, or failure to intervene early and 'rescue' patients (Hill, 2017, Griffiths, et al., 2018a; Griffiths, et al., 2018b), and evidence that it is wider and more complex issues than nurse vacancies or low staffing alone that result in lower quality of care (Duffield, et al., 2015).

Since 2014, when the National Institute for Health and Care Guidance (NICE) concluded that there was still insufficient evidence to be clear about the relationship between staffing, ward level factors and outcomes (NICE, 2014), some significant evidence has contributed to the debate. One measure of safe staffing is nursing hours per patient days, and wards with a higher number of nursing hours per patient days have a lower proportion of patients dying unexpectedly, considering patient age, comorbidity, nurse education level and characteristics of the nursing team (Haegdorens, et al., 2019).

What seems to be influential is not only the number of nurses but also the qualifications those nurses hold. Consideration of the skill mix between registered nurses and nursing assistants is critical as shortfalls of either can have negative consequences for patients (Needleman, et al., 2020). The relationship between registered nurses and hazard of death is linear, the lower the number of registered nurses, the higher the hazard of patient death. However, even if the number of hours a patient is cared for by nursing assistants is higher than the mean during their stay, their hazard of death rises (Griffiths, et al., 2019), indicating that increasing the number of nursing assistants does not compensate for a deficit of registered nurses. Given that the proportion of registered nurses delivering care in England is already one of the lowest in Europe (Aiken, et al., 2013), the importance of retaining those nurses already in post is critical for quality of patient care and patient safety.

1.1.1 The issue of nurses leaving their job or the profession

Turnover is higher in inner city areas (Finlayson, et al., 2002) and at certain points of a nurse's career such as shortly after qualification (Zhang, et al., 2016). Reasons for leaving include characteristics of the workplace, demographic variables, individual nurse characteristics and the complex interaction between these factors (Hickey et al., 2012; 2013). Workload is a strong source of job dissatisfaction and can lead to stress and burnout. Burnout syndrome is an occupational illness of high prevalence amongst nurses, which has repercussions for both patients and healthcare organisations as it may lead to provision of a lower quality service and higher turnover (Epp, 2012). Whilst there are discussions in the literature about psychological and sociodemographic variables that may influence burnout

syndrome, it is the vocational variables or occupational risk factors that are unanimously acknowledged to be important (Vargas, et al., 2014).

The impact of workload may be compounded by perceptions of lack of control in decision-making or lack of reward such as low pay or opportunities for advancement (Twigg and McCullough, 2014). Systematic review findings indicate that work environment and job satisfaction influence decisions to stay or leave; those nurses dissatisfied with their pay, shift patterns, or social rewards such as relationships and communication in their workplace are more likely to leave, and the decision is compounded by perceptions of poor management, and staff shortages (Chan, et al., 2013). Supervisor support is particularly influential on decisions to leave or stay, with a managerial style that encourages praise and recognition, trust, empowerment, and group cohesion having a positive effect on retention (Halter, et al., 2017). Heinen, et al., (2012) identified the value of community and relationships for a nurse within an organisation, or 'social capital' and the impact this has on retention. This concept is especially important for newly qualified nurses, as this is a high-risk time for turnover and when nurses traditionally have limited professional networks, and fewer mentorship opportunities. The more connections an individual has within an organisation, the more embedded they are, and this psychological and social engagement is a strong predictor for lower turnover (Jiang, et al., 2012). Engagement links to the organisational culture, a manifestation of the values, beliefs and behaviour patterns that form the core identity of the organisation, and which become important when there is lack of alignment between the values of the nurse and the organisation in which they are working (Jacobs and Roodt, 2008).

Certain individual nurse characteristics have been identified as predictors of greater likelihood of leaving. Younger nurses, male nurses and nurses who are more highly qualified are particularly vulnerable (Flinkman, et al., 2010). Work-family conflict, which is more likely to occur at the beginning of a nurse's career and between the ages of 30 and 40 years (Simon, et al., 2004) is also cited as a reason for leaving (Flinkman, et al., 2010; Chan, et al., 2013). Work-family conflict occurs when emotions and behaviours in the work domain spill over into the family domain with negative effects (Edwards and Rothbard, 2000). Nursing has been identified as a role that requires emotional labour (Badolamenti, et al., 2017) and

emotional charge such as this is also associated with work-family conflict (Cortese, et al., 2010).

Burnout is a concept that is related to experience of the work environment often linked with decisions to leave the nursing workforce (Borritz, et al., 2006). Seminal work by Maslach and colleagues (Maslach and Jackson, 1981a, b; Maslach and Leiter, 1997; Maslach, et al., 2001) identified burnout as a state of depleted personal and/or social resources caused by external factors such as negative perception of the work environment. The three dimensions of burnout: emotional exhaustion and energy loss; depersonalisation; and lack of personal accomplishment (Maslach and Jackson 1981 a, b), have significant consequences for the healthcare organisation, the individual, and the patient population.

A more recent review of the literature emphasised relationships between burnout, general health, sickness absence, and intention to leave, rather than links with actual turnover (Dall'Ora, et al., 2020). The theoretical review also raised questions about the temporal nature of adverse job characteristics as either predictors or outcomes of burnout. Undoubtedly, increased absenteeism, deteriorating mental and physical health, and poor quality of life, result in decreased quality of care and potentially attrition from the profession. Although burnout prevalence varies according to nursing role (Ahmadi, et al., 2014), psychological factors such as satisfaction with the workplace have been identified as protective factors (Gómez-Urquiza, et al., 2016). Known associations between burnout, the individual and the organisation (Adriaenssens, et al., 2015) allow interventions to be designed that will not only impact on burnout but also consequent decisions to leave a negatively perceived work environment. Early career nurses are particularly vulnerable to burnout due to the emotional effort required to adapt to the qualified nurse role, lack of confidence about competence, and diminished social support in the new workplace (Cao, et al., 2021).

Nurses leaving their jobs is often referred to as turnover, a widely used measure in healthcare organisations that can encompass nurses who leave a particular post, an organisation, or the profession entirely. Turnover may be voluntary, for example retirement, or involuntary, for example following performance management (Kovner et al.,

2014). It can also be internal (leaving for another job in the same organisation) or external (leaving the organisation entirely) and it is this complexity and lack of consistency of definition that have led to wide variations in turnover rates internationally (Halter, et al., 2017; Flinkman, et al., 2010). Nurses leaving has been described as a gradual withdrawal process, with nurses first leaving the ward or team they are working in, then the organisation and finally the profession (Morrell, 2005), suggesting that early identification and subsequent intervention with those considering leaving may be key. What is clear is that turnover in any form draws on healthcare organisation funding as it is expensive to recruit new nurses into the workforce. Nurses who leave take their experience, knowledge, and contribution to the organisation with them (Flinkman, et al., 2010). If they leave the profession entirely this is also lost from the nursing community and the financial investment in their education does not reap benefit. It is therefore valuable to consider how turnover can be reduced and retention of nurses increased, particularly voluntary turnover where nurses leave an organisation or the profession. Key factors impacting on nurses' intentions to leave have been identified, particularly the vulnerability of newly qualified nurses, and this may help to predict organisational and individual risk and shape interventions that mitigate high turnover (Twigg and McCullough, 2014).

1.1.2 Early career nurse turnover and retention

Early career nurses are more likely to leave than those at other points in their career. There is wide acknowledgement that the first year after qualification is a time when nurses are vulnerable to some of the individual level determinants of turnover such as stress and burnout, job dissatisfaction, and lack of commitment (Halter, et al., 2017; Flinkman and Salantera, 2015). The influence of work environment (Camveren, et al, 2020; Mills, et al., 2017), including workload, work-life balance, shortage of nurses (D'Ambra and Andrews, 2014), and the difference between expectation and reality (Camveren, et al, 2020; Duchscher, 2009) are highlighted as areas that affect nurses in this career stage.

Research and review of evidence shows that the work environment has a causal relationship with retention (Mills, et al., 2017; Duffield, et al., 2009; Laschinger, 2012) and as such plays a significant role in career choices. New nurses are particularly influenced, especially if they

perceive there to be poor clinical practice and patient care (Flinkman and Salanterä, 2015), which may cause them moral distress and lead to outcomes such as burnout, dissatisfaction, and intention to leave (Aiken, et al., 2012). One aspect of the work environment that impacts negatively on early career nurses is that of incivility, often characterised by bullying and horizontal violence, and associated with burnout (Spence Laschinger and Leiter, 2009; Laschinger and Grau, 2012). Incivility particularly impacts staff members in positions of relatively little power, such as newly qualified nurses. Victims of incivility are more likely to leave the organisation in response to job stress, psychological distress, and lower job satisfaction (Cortina and Magley, 2009). Interventions designed to support newly qualified nurses during their early career have been criticized as socialising them into a culture of incivility, rather than addressing the issue at source (D'Ambra and Andrews, 2014). Conversely, positive practice environments are associated with retention (Dawson, et al., 2014), and new nurses who can engage with high quality patient care, hospital decision-making, effective multi-professional relationships, and supportive leadership (Twigg and McCullough, 2014), are more likely to settle into the workplace environment and have fewer transition-related concerns (Kramer, et al., 2013). Structural empowerment or offering newly qualified nurses a work environment where they feel supported to deliver quality patient care results in higher job satisfaction and increased retention (Spence Laschinger, et al., 2016). If new nurses can practice in accordance with their professional values they are more likely to stay (Yarbrough, et al., 2017).

1.1.2.1 Socialisation of nursing students into the profession

Socialisation into the profession is integral to the transition from student to qualified practitioner and preparation extends to both the academic and clinical settings. Systematic reviews of qualitative and quantitative studies provide evidence that nurses' socialisation is influenced by role models, both when they are a student and once qualified, and it is important to consider the role that mentors, preceptors, and clinical leaders, play in the self-concept of newly qualified nurses (Price, 2009) and the subsequent decisions they make about entering and staying in the profession. Supervisor support is widely recognised as an important factor for retention (Halter, et al., (2017).

The challenges that newly qualified nurses face have been attributed in part to the phenomenon of transition shock (Duchscher, 2009). Transition shock is a concept that builds on the work of Kramer (1974). Kramer characterised this as a reality shock when new nurses discover challenging differences between their experiences and perceptions of their role as students and qualified practice. Role ambiguity, derived from new nurses struggling to find their way in an environment that differs from the ideals they have been taught as students, causes disillusionment and job dissatisfaction (Duchscher, 2001; Chang and Hancock, 2003). Transition shock highlights the contrast between the familiarity of the academic environment and the new roles, responsibilities, and relationships of the qualified practice setting. The resulting disorientation is likely to be expressed in a range of emotional, physical, socio-cultural, and intellectual ways (Duchscher, 2009; Boychuck-Duchscher, 2012). One solution may be that newly qualified nurses are better prepared for practice by addressing the theory-practice gap (Levett-Jones and Fitzgerald, 2005; Maben, et al., 2006), however, the complexity of modern nursing, with a myriad of different settings and eventualities make adequate preparation difficult (El Haddad, et al., 2012). Instead, a range of transition to practice programmes have been implemented to support newly graduated nurses to adapt. Such programmes have been seen as invaluable to supporting new nurses (Ankers, et al., 2018) and retaining them in the profession.

Recent studies in China have strengthened knowledge that transition shock directly affects turnover intention of new nurses (Cao, et al., 2021). The work also highlighted that nurses' resilience, social support, and work environment, are predictors of transition shock. This relationship suggests that enhancing resilience and social support, and focusing on a healthy work environment, where early career nurses feel empowered and involved in decision making (Spence Laschinger, et al., 2016) may reduce difficulties with transition and increase retention (Cao, et al., 2021). Positive work environments have been the subject of several national and international studies relating to transition and have been established as a significant factor influencing environmental reality shock (Kramer, 2011) and transition shock (Kim and Yeo, 2021; Kim and Yeo, 2019; Ho, et al., 2021; Kim and Kim 2020). Positive work environments are situations where there is adequate staffing, a positive collaborative culture between nurses and doctors (Kim and Kim, 2020), and where new nurses feel a

sense of belonging, feel empowered and supported (Ho, et al., 2021), which to a large extent are contextual issues within the control of managers in the clinical areas.

In addition to environmental factors, individual factors influence the extent of transition shock and in turn the intentions of a newly qualified nurse to remain in their role or the profession. The self-concept, or nurse identity that is developed by the individual, is an important predictor of retention in the profession, and is particularly informed by the first year of qualified practice (Cowin and Hengstberger-Sims, 2006) as new nurses increase their self-confidence, competence, and perception of self-efficacy. Higher self-efficacy is associated with lower transition shock, knowledge which is useful when designing pre-registration education programmes (Kim and Yeo, 2021). The impact of individual resilience has been examined in several studies (Kim and Kim, 2020; Cao, et al., 2021a; Cao, et al., 2021b), with mixed findings. Kim and Kim (2020) found that resilience of students in South Korea was not associated with transition shock, conversely, studies of Chinese students (Cao, et al., 2021a; Cao, et al., 2021b), identified resilience as an area that nurse managers should aim to enhance, in order to reduce transition shock and increase retention. This suggests that the cultural context is an important consideration when identifying strategies to support during the transition period.

Resilience and adaptive coping were also found to be a positive predictor of compassion satisfaction, a key component of professional quality of life and contributor to job satisfaction, anxiety, depression, and turnover intention (Hegney, et al., 2014; Pang, et al., 2020). Compassion satisfaction is the positive emotion that nurses feel when they see the impact that their care has on a patient's life (Harr, 2013). It can be enhanced when a nurse has realistic expectations of the work they can accomplish and feels their experience and competency are being utilised in their role (Craig and Sprang, 2010). Compassion satisfaction also contributes negatively and significantly to burnout (Cao, et al, 2020b), and is potentially a more productive area of focus when designing interventions than compassion fatigue (Harr, 2013).

Attention has also been given to the impact of the role of mentors and preceptors in mitigating transition shock (Chen, et al., 2021; Su, et al., 2021; Powers, et al., 2019). The

behaviour of clinical educators is seen as important, given that individuals often lose access to social support systems established in higher education as they transition from students (Ankers, et al., 2018). The preceptor or mentor role is pivotal in the socialisation of the students or newly graduated nurses into the profession. They are central to helping develop critical thinking skills (Powers, et al., 2019), which is integral to increases in confidence, competence, and nurse-identity (Chen, et al., 2021; Cowin, 2006). Clinical educators need to be aware of the potential for transition shock, understand the facets of the phenomenon, and adapt their level of support to suit the stage the individual nurse is at in their transition (Graf, et al., 2020a).

There is a wealth of evidence to support the need to address issues that impact on transition shock, and consequently, retention of early career nurses. However, caution should be used when considering newly qualified nurses as a homogenous group (Flinkman and Salanter, 2015), as individual level determinants are moulded by prior character, experience, and expectation (Kim and Yeo, 2019; Mills, et al., 2017). There is evidence that individual nurses are affected differently by the transition, and pre-determinant factors may also relate to the adequacy of the undergraduate education programme (Duchscher, 2009; Graf, et al., 2020b). In addition, the influence of factors such as work environment, resilience and self-concept are greater at different points in a new nurse's early career (Mills, et al., 2017; Graf et al., 2020a), giving rise to speculation about when targeted support would be best provided.

1.1.2.2 Preparing student nurses for transition to qualified practice

The variation in pre-registration nursing education programmes internationally, particularly the proportion of classroom based didactic learning, compared to clinical based experiential learning, is another important factor when considering how to increase early career nurse retention. In the UK, pre-registration programmes consist of a 50:50 split between the two types of learning, and students are expected to complete 2,300 hours of clinically based education (NMC, 2018). Although spread throughout the pre-registration programmes, much of this clinically based learning is undertaken in the final year prior to qualification and will be spent developing practical nursing skills and critical thinking. This time spent in

clinical placements by UK students far exceeds the amount of clinical exposure incorporated in programmes delivered in the USA, Australia, or Canada. It would be reasonable to hypothesise that transition shock may not be such an issue in the UK due to early socialisation into the nursing role, and development of nursing self-identity throughout the pre-registration programme. However, recent work exploring job embeddedness of early career nurses (Ho, et al., 2021) found that newly qualified nurses who were educated in the UK higher education system did not feel their programme prepared them for their new role, potentially due to working in a supernumerary capacity; students are not counted in the workforce establishment, spend much of their time observing permanent staff, and do not have the same responsibility as qualified practitioners. Previous work had identified that nurses educated following an apprenticeship-style training experienced less stress relating to their early qualified role than those who held supernumerary status as students (Gerrish, 2000). The UK position is further evidenced by a national report on the RePAIR Programme (Reducing Pre-registration Attrition and Improving Retention) (HEE, 2018). This large-scale initiative focused on attrition from pre-registration healthcare education programmes and reiterated the experiences of UK students throughout their journey. The term ‘flaky bridge’ was coined by the RePAIR project team to describe the transition from final year student to employee, and student participants described the challenges related to confidence and competence when crossing that bridge. A key finding was that students often chose their preferred first destination post based on their perception of an organisation’s preceptorship provision and the support they would be likely to receive as qualified nurses.

The RePAIR programme has given momentum to certain regional initiatives, for example, the Capital Nurse programme in London ([CapitalNurse | Health Education England \(hee.nhs.uk\)](https://www.healtheducationengland.nhs.uk/capital-nurse)). This is relevant to this London-based study because of the impact it may have had on participants as the programme aims to ease transition into qualified practice, potentially overlapping with wider aims related to nurse retention in the city. Initiatives such as the pan-London skills passport not only simplify movement between different healthcare organisations, but also reiterates to the passport holder their level of competence, potentially leading to increased confidence and nurse self-identity. Other initiatives such as standardised preceptorship in the first year after qualification, rotations

within and between healthcare organisations, and a guaranteed employment offer for final year student nurses, contribute to the retention of newly qualified nurses in the capital.

1.1.3 Strategies to reduce nurse turnover and increase retention

Although current nurse workforce issues are particularly acute, this is not a new concern, and the international nursing literature is replete with examples of initiatives to reduce turnover and increase retention in high- and medium-income economies. A high-profile example is the American Magnet Recognition Programme. This initiative started in 1994, encouraging healthcare organisations to undertake a pathway to excellence, with a focus on the working environment and quality patient care. This ultimately impacts on retention of nurses (American Nurses Credentialing Center, 2020), quality of nursing, and better patient outcomes (Kutney-Lee, et al., 2015). The success of the programme has led to expansion beyond the USA, with one UK NHS organisation currently holding Magnet® status (Nottingham University Hospitals, 2021).

Despite recognition of the need to retain nurses at all stages of their careers, and implementation of organisation-wide strategies such as the Magnet® programme, in many countries there has been a particular focus on those in the early stages of their careers. The transition from student to registered nurse is seen as a critical time with high turnover (Zhang, et al., 2016). Broadly speaking, focused initiatives fall in to two categories: those that can be implemented during the undergraduate nursing education programme, with the intention of reducing the likelihood of leaving once qualified, and those that are implemented in the first few months or year after graduation, with the intention of retaining the newly qualified nurses in their role or the profession. Interventions evidenced in the literature include externships, clinical immersion programmes, preceptorship, mentoring programmes, residency programmes, internships, transition, or orientation to practice programmes, psychological wellbeing programmes, and clinical ladder programmes. These different interventions are explored in more detail below.

Externships are an intervention that was established in the USA in the late 1970s to offer opportunities for senior nursing students to experience working in the clinical area, often in

the summer prior to their final year as undergraduate students. Externships have been positively evaluated in several published papers (Cantrell and Browne, 2005, 2006; Cantrell et al., 2005). Students spend 6-12 weeks immersed in the clinical environment, under the supervision of a registered and experienced nurse, benefiting from the repeated exposure to clinical scenarios that support them to increase their self-confidence and competence, particularly with clinical skills and decision making. Externships are therefore especially useful for students who have high anxiety about clinical practice, or low levels of confidence about their clinical ability (White, et al., 2019a; Remle, et al., 2014). They also offer the potential advantage of narrowing the theory-practice gap and easing the transition into qualified practice (Ruth-Sahd, et al., 2010, Ruth Sahd, 2016; Shipman, et al., 2016; Mang, 2011). Externships may be intended to introduce student nurses to the nature of work in a particular healthcare organisation, to a specialist area that is more difficult to recruit to, or where there is a high turnover of staff, and therefore act as a recruiting tool for healthcare organisations (Souder, et al., 2012; Remle, et al., 2014; Shipman, et al., 2016), and empower students to make an informed career choices. Pre-qualification introduction to these areas offers nursing students the opportunity to experience the reality of the role, the culture of the clinical area or organisation, and to gain hands-on experience that will contribute to their learning and development (Shipman, et al., 2016; Soto, 2015). Externships are usually funded so that students are at the least reimbursed for living expenses or may receive a wage. Due to the level of supervision from an experienced mentor or preceptor, they are seen to be more effective for student development than working as a paid nursing assistant during the summer period (White, et al., 2019a), despite the financial burden to the organisation (Oja, 2013). Consequently, acceptance onto externships is usually competitive, with offers being subject to interview, written application, and evidence of good academic standing (White, et al., 2019b). In some cases, the program is run independently by the healthcare organisation, and others are run as a partnership between the university School of Nursing and the hosting healthcare organisation (Shipman, et al., 2016; White, et al., 2019b). An externship is particularly valuable in nursing programmes that are weighted heavily in favour of theory rather than practical placements. Both the student and the host benefit from being able to assess each other and consider recruitment opportunities post qualification.

Clinical Immersion Programmes are another strategy used in the pre-registration period to better equip student nurses for the transition to qualified practice, and potentially encourage them to remain in post once qualified. Much of the literature focuses on use of this strategy in the USA, where healthcare organisations stated students were not well enough equipped to deal with the complexities of modern patient care on qualification (Spector, et al., 2015), potentially due to lack of synergy between elements taught in the classroom and application of the learning in the clinical environment (Benner, et al., 2010). Clinical immersion programmes consist of a period of exposure to clinical practice for students, often in the last part of their undergraduate education programme after the academic aspects of the course have been completed. During this period they may be supported by a preceptor, assessed regarding their ability to apply theory to practice, and can experience the reality of the nursing role. Students benefit from clinical immersion due to enhanced socialisation, and by developing their critical thinking skills and confidence to manage the full continuum of patient care (Kumm, et al., 2016). Although there is a body of literature that evidences student satisfaction with their experiences of clinical immersion, that students develop feelings of belongingness, increase their confidence, and feel better prepared for practice (Kumm, et al., 2016), this does not necessarily correlate with improvement in performance (Fowler, et al., 2018). More research is required to establish the most effective implementation model, especially as hybrid models have recently been introduced with positive effect (Lindell, et al., 2018; Kulju, 2020; Thelen, 2021).

Capstone Experiences were again initiated in the USA, in response to criticism about the readiness of newly graduated nurses to work in the contemporary clinical environment (Usher, et al., 2015) and have since been incorporated widely across nursing programmes internationally. Capstone experiences are usually implemented at the end of the final pre-registration year of study for up to one semester and are delivered as a partnership between the university school of nursing and the healthcare organisation, offering students clinical experience with the support of a preceptor (Martin, et al., 2011). They are an opportunity for senior students who have mastery of the fundamentals of nursing care, have completed prior course work and are motivated, creative, and self-directed, to apply their learning in a clinical environment. Students can also be assessed in relation to programme outcomes, increase their confidence, collaboration skills, critical thinking skills, and prepare

for a smoother transition into practice (Schroetter and Wendler, 2008). More recent iterations of capstone experiences suggest that it is the autonomy to independently manage the care of multiple complex patients, in a realistic hospital environment, that helps empower students and prepare them for qualified practice (Welch, et al., 2019). There is increasing evidence of simulated scenarios being used either to prepare the students for the capstone experience, or as part of the experience itself, and the benefits of this regarding reduced anxiety and increased confidence for senior students (Smallheer, et al., 2018; Gunberg and Carney, 2017). Advantages related to retention are less clearly articulated and are associated with easing the transition from student to accountable practitioner.

Psychological wellbeing programmes are intended to relieve stress in nursing students or newly qualified nurses to help them to respond more effectively to the demands of their roles. Such programmes target the stress that is known to be endemic in the nursing profession, leading to burnout and attrition from the workforce (Aiken, et al., 2001; Aiken, et al., 2012), and may take the form of programmes that promote resilience (Delaney, et al., 2016), cognitive reappraisal (Hamrin, et al., 2006), or relaxation and mindfulness (Chen, et al., 2021; Cheli et al., 2020; Leslie, et al., 2020), amongst others. Programmes that incorporate skills to enable cognitive reappraisal of maladaptive cognitions, as well as relaxation, are consistently seen to be the most effective, and are underpinned by strong theoretical rationale (Galbraith and Brown, 2011; Chen, et al., 2021). The impact of stress relieving interventions on outcomes such as attrition and absence require further investigation (Galbraith and Brown, 2011) and further research is required to determine which point in the undergraduate curriculum or post-qualification period these interventions should be implemented for maximum effect.

Preceptorship is a concept that was first employed in America to support the transition of nurses from student to licensed practitioner, following evidence that new nurses were suffering from 'reality shock' (Kramer, 1974). It has since been adopted by several countries, such as Canada and Taiwan, to support adjustment to the workplace, the development of confidence and competence, and to reduce turnover (Ke, et al., 2017). In the UK, preceptorship is regarded as a way of socialising newly qualified nurses into the profession and Nursing and Midwifery Council (NMC) principles for preceptorship have recently been

published (NMC, 2018). The format of preceptorship programmes varies from a basic system where a newly qualified nurse is allocated a preceptor and regular meetings are arranged, to more complex programmes involving formal teaching, supervision, and competency assessment (Irwin, et al., 2018). In addition, the length of a preceptorship programme, whilst usually defined, can range from a few weeks to up to two years in duration. Fundamental to all preceptorship is the relationship between the experienced, qualified nurse (preceptor) and the newly qualified nurse (preceptee) and the provision of psychological support, knowledge exchange, and role modelling. In the UK, preceptorships are implemented once nurses have qualified, but in other countries such as America, Canada, or Australia, they may be implemented in the undergraduate period.

Mentoring programmes differ from preceptorship as the relationship between the mentor and the newly qualified nurse may be more enduring and nurturing. A mentor may draw on strategies such as befriending, encouraging and counselling as well as role modelling and teaching to support their mentee (Zhang, et al., 2016). The mentoring relationship is important to transition into the workplace and can be effective in the reduction of turnover during the first year of practice as a qualified nurse (Beecroft, et al., 2006). Mentoring programmes vary widely in format and intensity, including dyad models, peer mentoring, group mentoring, constellation models or online distance mentoring (Nowell, et al., 2016). The relationship between the mentor and mentee is again central to the process and some programmes suggest that careful allocation of mentor to mentee is crucial for success. Others rely on self-selection of mentor/mentee pairs or provide incentives such as remuneration to motivate tenacity in the relationship (Fox, 2010). Mentoring programmes may be implemented either pre- or post-registration. In the UK, the mentoring relationship has been integral to nursing student education for many years (NMC, 2018).

Residency Programmes and internships emerged in the 1980s in response to recruitment and retention challenges of early career nurses (Altier & Krsek, 2006). Predominantly established in USA, Canada and Australia, these programmes aim to ease the transition in to nursing practice by developing and consolidating clinical reasoning and leadership skills of new graduates. In contrast with mentoring programmes these are contractual arrangements between the new graduate nurse and the employer (Al-Dossary, et al., 2014), usually lasting

between six months and one year and delivered as a partnership between academia and practice (Herdrich & Lindsay, 2006). The benefits of residency programmes are described as improved nurse graduate self-confidence, improved skills competence, increased commitment to the nursing profession, and decreased turnover (Al-Dossary, et al., 2014). Key characteristics of residency programmes or internships are extended orientation time, structured and didactic teaching sessions linked to clinical immersion, and a mentoring relationship (Herdrich & Lindsay, 2006). These programmes are often used as a recruitment strategy for new nurses and in recent years programmes have become increasingly standardised and commercialised as cost-effectiveness has been demonstrated (Trepanier, et al., 2012). Internships are usually implemented in the first year after graduation, but there are some examples of internships implemented in the pre-registration period (Steen, et al., 2011; Dela Cruz, et al., 2013) in the USA.

Orientation and transition to practice programmes are like residency programmes and internships in that they are characterised by formal teaching and a mentoring or preceptor relationship, however they are often shorter in duration (Edwards, et al., 2015). Designed to support the socialisation of new nurses in to the workplace, orientation programmes may be generalised to promote transition in to the organisation (Newhouse, et al., 2007), or more specialised, to facilitate development of skills specific to a particular clinical area (Friedman, et al., 2011; Orsini, 2005). Specialised orientation is a needs-based programme aimed at closing gaps between the new nurses' role related knowledge and the clinical skills required for the specialised area, for example orthopaedics, paediatrics, or critical care, ultimately leading to fewer errors and near misses with patient care (Salt, et al., 2008).

Clinical Ladder or Advancement Programmes are organisational structures that allow nurses to gain promotion and recognition for their developing skill and achievement. Used as a recruitment and retention initiative in many countries, including the USA, Nepal, Norway, China, Turkey and Korea (Yu & Soyoung, 2014), they are also implemented as a means of enhancing the quality of nursing care and as a mechanism for enhancing nurse satisfaction. They are particularly attractive for motivated nurses who aspire to develop into leadership roles (Warman, et al., 2016).

In reality, there is substantial overlap between different types of interventions to support transition from student nurse into qualified practitioner and encourage retention of early career nurses; individual programmes may not fit neatly in to one category and individual components, such as formal teaching or mentorship, may be present in different types of intervention. There is also the potential for significant variation between the content and quality of the programmes within each category. This is influenced in part by the approach to nurse education in different countries and the varying emphasis on theory and practice during the pre-registration programmes. For example, in the UK, the Nursing and Midwifery Council requires student nurses to complete 2,300 hours of practice placements during their three-year programme, equating to a split of 50% practice and 50% theory (NMC, 2018). In Australia and America, students generally complete around 800 hours of clinical placements plus simulation during their programme. Newly qualified nurses will therefore require different types of support in their final year of study or first year after qualification. By offering a transition to practice programme of any description, the organisation is indicating the importance attached to newly qualified nurses and this alone may be enough to positively influence recruitment and retention (Edwards, et al., 2015).

1.1.4 Empowerment and early career nurse retention

The issues impacting early career nurse retention are complex but recurrent themes linked to preventing attrition are development of self-confidence and feeling empowered. In particular, strategies to increase retention can be aligned to the macro-theory of empowerment, including autonomy and self-determination. Empowerment theory links an individual's wellbeing with their social, organisational, and political environment (Perkins and Zimmerman, 1995). It has been described as a construct that connects individual strengths, competencies, and proactive behaviour, to social policy and social change (Rappaport, 1984). It is particularly relevant to early career nurses because of the well-defined links between a work environment where nurses feel empowered to participate and make decisions, and retention of nurses in their role and the profession (Friend and Sieloff, 2018, Twigg and McCullough, 2014; Zurmehly, et al., 2009; Spence Laschinger, et al., 2009; Smith, et al., 2012).

There are multiple perspectives of empowerment, but those most relevant to nurse retention are theories of organisational empowerment. Work in this area identified three components of an empowered organisation, each of which is linked to organisational processes and empowerment outcomes (Perkins and Zimmerman, 1995; Peterson and Zimmerman, 2004). The first component relates to intraorganisational factors, or the internal structures of the organisation, the second to interorganisational factors such as relationships and collaborations between organisations, and the third to extraorganisational factors, or the efforts of the organisation to influence the wider systems of which they are a part. These broad components are useful when considering how best to approach the design of an intervention to increase retention of early career nurses. Organisational empowerment theory also helps contextualise the challenges students face when navigating a path between the requirements of their university and the healthcare organisation where they have clinical placements, and the tensions in the workplace once qualified. Studies indicate that it is the workplace factors potentially under the control of healthcare management that have an important role in influencing newly qualified nurses' job satisfaction and turnover intentions (Laschinger, 2012; Pineau Stam, et al., 2015; Read and Laschinger, 2015).

Structural empowerment theory can be attributed to Kanter (1977; Kanter, 1993), who identified how social, political, and organisational conditions can influence powerlessness in an organisation. The focus is on the structures, policies, and practices that are used to distribute authority and responsibility throughout the organisation. Kanter identified that power was derived from both the relationships that an employee had with fellow workers, including subordinates, peers, and managers, from the nature of the job the individual held, the centrality of that role to the purpose of the organisation, and the flexibility the position afforded the employee. These lines of power in an organisation can either support or restrain an individual on their journey towards optimal job performance (Dean-Martin, 2020). Kanter's theory placed four conditions at the centre of an empowering organisation: access to information; opportunity for advancement; access to support; and opportunities to grow and learn. To develop effective retention strategies, these aspects of the work environment should be the focus of nursing or academic leaders (Zurmehly, et al., 2009; Smith, et al., 2012).

Subsequent post-Kanter development of the structural perspective of organisational empowerment has augmented the original four conditions. There is now recognition that in a structurally empowered organisation, employees have access to transformational leadership (Dust, et al., 2014), creation of a participative work environment (Spreitzer, 1996), job enrichment (Leach, et al., 2003), and intrinsic task motivation (Thomas and Velthouse, 1990). Access to these conditions is controlled by formal and informal power dynamics in the organisation. Early career and student nurses traditionally perceive that they have very little power, and can feel excluded from hierarchical structures, limiting their ability to effect change required to increase job satisfaction (Kanter, 1993). Authentic and transformational leadership is an effective way to support them to develop relational social capital, which has positive mental health and retention outcomes (Read and Laschinger, 2015). Both personal factors, such as social capital, and structural workplace factors are important to newly qualified nurses' job satisfaction (Pineau Stam, et al., 2015). There are limited reports of interventions to extend connectedness within social (professional) networks and support within the organisation. Those that are published demonstrate the benefits that high levels of social capital can bring in terms of improved patient care and patient safety, a more satisfied and productive workforce and improved nursing staff retention, as well as bridging hierarchies between students, newly qualified nurses, and the established workforce (Hofmeyer and Marck, 2008; Hsu, et al., 2011). The focus of these interventions is to extend social capital by facilitating the self-creation and strengthening of networks. Social identity is an important contributor to organisational commitment (Clements, et al., 2016, Parker, 2007), affecting how engaged individuals are within a social network. The importance of relationships with fellow workers and opportunities to grow and learn provide a rationale for educationally based interventions to increase retention of early career nurses, especially those with emphasis on building social networks and capital.

More recently, consideration is being given to the importance of participative organisational processes as a mechanism for empowerment, and the self-transformational nature of this process (Francescato and Aber, 2015). This is a potentially useful strategy for developing appropriate interventions to increase retention. Modelling the development of networks and engagement by involving participants in both development and implementation of the

interventions is a compelling proposition. One way to achieve this is through co-production, which aligns with these ambitions and is well-established as a mechanism to develop health services for patients. Co-production of knowledge in research projects is also becoming increasingly well-established internationally (Gillard, et al., 2012) but is not explicit as a method used in the body of literature around early career nurse retention. Not only does co-production of the intervention role model participative processes, but the output promises to be a more relevant and pragmatic solution to the problem of attrition from the workforce. The following section explores the concept of co-production and its utility in the context of developing interventions to improve early career nurse retention.

1.1.5 Co-production as an intervention development strategy

The value of service user involvement in creating health services that are fit for purpose is increasingly recognised in UK policy (Potter, et al., 2015), and this is mirrored in the expectation that service users will be involved in higher education institution programme development and delivery (United Kingdom Standing Committee for Quality Assessment, 2018). Although numerous interventions designed to improve early career nurse retention are reported in the literature, the voice of students and early career nurses is not prominent in reports of development of these interventions, potentially limiting their relevance and effectiveness. Involving early career nurses and nursing students in the development process could enable richer understanding of the lived realities of those who are most affected by nurse turnover and retention (Haux, et al. 2012), perspectives that are less accessible through more traditional methods of intervention development. The explicit inclusion of student and early career nurse voices may also foster greater engagement with the intervention by their peers, as the final product would be more likely to resonate with those affected (Coppock, 2011).

The co-production approach has potential to fit appropriately with the design of an intervention to support newly qualified nurses, one that aims to empower and encourage the development of social capital in the workplace. In addition, the growing importance of empowerment of staff, patients, and community in helping the NHS meet future challenges

(NHS England, 2014) reiterates the fit of co-production with the health service workforce context.

1.1.6 What is co-production?

Traditionally developed in relation to service improvement (Osborne, et al., 2016; Robert and Cornwell, 2013), co-production is a technique that attempts to include individuals not traditionally seen as ‘experts’, but instead are seen as ‘users’, in the development of services or products and is a technique that has been growing in popularity both nationally and internationally over the past decade (NIHR, 2018). There is no consistent definition in the literature but Durose, et al., (2017, P135) describe co-production as ‘joint working between people or groups who have traditionally been separated into categories of user and producer’.

Co-production originated in public service administration, with recognition that drawing on the expertise of a plurality of actors was a practical and reinvigorating solution to complex problems (Sorrentino, et al., 2016). Whilst the construct of co-production is continually evolving (Sorrentino, et al., 2018), the benefits outlined in the wider literature such as more sustainable change, greater translation of knowledge into practice and closing the theory-practice gap (Durose, et al., 2011), are of relevance to clinical and higher education contexts. Working closely with service users aligns with the professional person-centred values central to healthcare service delivery (Atkin, et al., 2020), reiterated by the UK NHS Constitution (Department of Health, 2019), emphasising that the patient should be at the heart of everything the NHS does.

Co-production focuses on a commitment to working together, recognising the equity of all forms of knowledge, and the social capital of the participants (Voorberg, et al., 2015). Co-production sits at the upper end of Arnstein’s Ladder of Participation (Arnstein, 1969), where more power is transferred to service users than occurs at lower levels in the ladder (Beresford, et al., 2015). However, co-production can be implemented at the individual level, where a service user may make supported decisions about their own care or service innovation, or at strategic level, where groups of service users may work in partnership with

professionals to design and deliver services. Participants in co-production accept the different roles individuals play in the process; there is recognition that although different parties may require different outcomes, undertaking the journey together will result in a jointly owned product (Hickey, 2018). Co-production offers the benefit of shared experience, which may also leave a more enduring and beneficial legacy than traditional forms of service development in terms of social capital and both collective and individual gain.

Co-production, as a form of participation, highlights the move away from academically led scientific projects, to a model that involves a range of different types of both scientific and non-scientific expertise, or 'expert laity' (Gibbons, et al., 1994). This inclusion and integration of different epistemological perspectives to collectively construct new knowledge has marked a watershed in accepted understanding of 'good science' (Gillard, et al., 2012). Individual experience is now recognised and valued as a key contribution to project, process, or product design (Durose, et al., 2011).

1.1.7 Co-production in education

Co-production is gaining in popularity in the higher education sector, with evidence that the transition of learners from participants to co-producers enhances their development of life skills outside of education and hastens the formation of social capital in society (Athakkakath, et al., 2015). This is particularly effective if stakeholders from the professions join academics and students in the co-production of curricula, learning, or other products to develop fit for practice and employable graduates (Ramirez, 1999). Involving students and early career nurses in the co-production of an intervention to increase their retention potentially offers the co-production group members the opportunity to engage in collaborative learning, develop positive interdependence, and focus on individual responsibility and collective accountability for the task (Johnson, et. al., 2007).

Co-production in education aligns, to some extent, with the pedagogical concept of co-operative learning, which recognises the importance of peer interaction and relationships in socialisation and learning. In particular, the theory of positive interdependence (Lewin 1948;

Deutsch 1949) has high resonance with the co-production process. This exists when individual students believe they can achieve their goals only if other members of the group with whom they are cooperatively linked also achieve their own goals, fostering a 'sink or swim together' mentality. Positive interdependence catalyses a culture of individuals facilitating and encouraging other's efforts by promotive interaction so that the group's goals are met (Johnson and Johnson, 2009) and as such, results in increased achievement and productivity. Co-operative learning is widely used in higher education with a range of resultant individual and collective benefits. These include the development of trust, motivation, high level critical thinking and reasoning, long-term retention of learning, development of problem-solving skills, and opportunities to hear a broad range of opinions and viewpoints (Johnson, et al., 2007). In addition, positive interdependence enhances individual psychological health (Johnson and Johnson, 2009). An important group level benefit is the positive relationships and social support that can be developed between group members from different backgrounds.

Critics of co-operative learning highlight the potential for social dependence, the key role of the facilitator to ensure positive interdependencies fostered, and the potential for failure if group members are unable to reach a consensus due to real life challenges, for example, non-cooperative individuals, untrustworthy group members or over-influential leaders (Collazos, et al, 2003). Conversely, there is a wealth of evidence to support the effectiveness of collaborative learning in education (Scager, et al., 2016; Johnson and Johnson, 2009). Given the similarities between the principles underpinning co-operative learning and those underpinning co-production, such as the commitment to working together, recognising the equity of all forms of knowledge, and embracing the social capital of the participants, there is a strong argument supporting the higher education context as a fitting arena in which to utilise co-production.

1.1.7.1 Co-design of education programmes

Whilst co-production is a relatively new phenomenon in the nurse education context, it offers potential to support students as co-production group members to evolve beyond passive receivers of knowledge. Such active learning awards agency to the students,

facilitates development of meta-cognitive awareness about what is being done and arguably changes not only what the learner ultimately knows but also who the learner is (Cook-Slather, 2006). A recognised challenge is the paradigm shift those students must undertake to see themselves as co-producers rather than participants (Vargo and Lush, 2004) and acknowledge the capital they bring in terms of experience and perspective. Students traditionally expect a linear transfer of knowledge from lecturer to student, with the lecturer as the expert and the student as the passive recipient. Co-production aims to break down power differentials and there may be resistance to this transformation by both academics and students (Bovill, et al., 2011). Consequently, students who have developed skills in co-operative learning may be more readily receptive to the requirements of a co-production project. The clearly defined purpose and goals of co-production in education will support achievement of mutually beneficial outputs (Athakkakath, et al., 2015).

Although literature reporting co-production projects involving students in nursing education is scarce, one notable example is a successful project to design and develop technological learning for clinical skills training (Haraldseid, et al., 2016). The project actively involved nursing students in the co-production of the learning material during an iterative process. The authors concluded that while the process resulted in many benefits for both students and staff, such as identification of learning needs, it was important to retain a balance of power between students and academics in the higher education setting.

Arnstein's (1969) seminal work constructing a 'Ladder of Citizen Participation', offered insight into levels of public participation in decision making. Drawing on this model suggests that student participation, free from the influence of the academic, with students gaining overall control of the process and outputs, should be the goal and represents the highest rung on Arnstein's ladder. However, it is important to acknowledge Arnstein's perspective when constructing her analogy, born out of her work and experience in social care and welfare, and how this lens may be less suited for undertaking co-production with students. Aiming for citizen control in education settings may be undesirable as students particularly identify the need for the support of an academic to help them see and understand issues that they may otherwise miss (Hattie, 2013). One of the principles of co-production is that the input of all stakeholders is valued as they work towards a common goal, as recognised in

Haraldseid et al's (2016) project, where collective and inclusive endeavour was perceived as the optimal level of involvement for both students and staff. Additionally, at strategic level, the university quality assurance processes impose parameters on the extent of student control in an educational scenario (Quality Assurance Agency for Higher Education, 2018). These quality assurance standards are difficult to meet if students are awarded the level of power suggested by Arnstein (1969) as ultimately desirable. In higher education, a more pragmatic and acceptable approach is to aim for partnership rather than 'citizen' or student control.

1.1.8 Challenges of co-producing services, interventions, and policies for education and practice

Despite the importance that policy makers attach to co-production, a systematic review (Voorberg, et al., 2015) identified a dearth of studies that addressed the outcomes and concluded that the process is primarily seen as a virtue, with few external objectives given to legitimise the choice of process. Potential achievable objectives included increased effectiveness, efficiency, and service user satisfaction. Challenges included lack of awareness about co-production, preconceptions about service users' ability to co-produce, service and time constraints, and developing, managing and utilising sometimes tense partnerships (Holland-Hart, et al., 2019). Ultimately, knowledge is scarce about how co-production works in practice, in what context it is best utilised, or whether it is a superior approach to alternatives (Oliver, et al., 2019).

Criticism of co-production as difficult to evaluate, in terms of epistemological impact on process (Smith et al., 2008; Staley, 2009), may stem from the longstanding debate about the nature of knowledge and expertise (Durose, et al., 2011). Conflicting ideas about the definition of added value, the patient perspective, and productivity in healthcare research, presents inherent challenges to the process (Filipe, et al., 2017). Drawing on a range of different voices through co-production can offer understanding to bridge a dichotomy between conventional knowledge and what had previously been considered alternative 'radical' knowledge (Gillard, et al., 2012) but conversely, ambiguity and conflicting assumptions about the concept can make collaboration complex to initiate. Skilled

facilitation is required to negotiate the potentially different stakeholder communication processes and styles of thinking and promote joint reflection towards a common understanding (Pohl, et al., 2010). These complex relationships may require knowledge to be produced at a slower pace, drawing on experimental forms of learning and critical thinking (Filipe, et al., 2017).

Due to the relative novelty of co-production, particularly in education or nursing research, one reported challenge is the lack of preparedness of established processes such as ethics committees to support collaborative working. This is evident where assumptions around stakeholder suitability lack the nuance required but are still influential in decisions about ethically acceptable process (Lambert and Carr, 2018). The most reported barrier to co-production is associated with the perceived capability of participants to be partners in co-producing services, knowledge, or research. Concerns are related to the physical and mental health of participants, and their psychological capabilities, including health literacy, communication skills, and empowerment and self-efficacy (Holland-Hart, et al., 2019). However, once the unfamiliar concept of co-production is explained to participants, it is found to be generally acceptable (Brook, et al. 2020).

There is little doubt that co-production requires investment in relationships to facilitate the sharing of different points of view and foster ownership in the process and outcomes (Vindrola-Padros, et al. 2019). These relationships are often derived from prior associations, which may result in imbalances around gender, experience, or attitude, leading to homogeneity of opinion that does little to challenge the status quo (Oliver, et al., 2019). To enable the blurring of boundaries that is integral to co-production, implementation must support congruity between social and symbolic boundaries. If co-production is implemented merely symbolically, participants are likely to act 'as if' boundaries are blurred, potentially masking resistance, reinforcing institutional practices, and ultimately generating ambiguity and lack of conviction (Kirkegaard, et al., 2018).

Relationships may have inherent tensions that are challenging to manage, and which may come at a personal or professional cost to those involved. Researchers investing time in co-production may find it difficult to negotiate the boundaries between their roles as

academics and their roles as co-producers, with subsequent impact on their ability to maintain the rigour and consistency of the project, or to meet project outcomes, leading to reputational impact (Vindrola-Padros, et al. 2019). Managing the interpersonal tensions that inevitably arise from the engagement of different parties with inherent power imbalances requires levels of tact and diplomacy that may be a significant emotional strain on co-production participants and may risk them being perceived as partisan or lacking in credibility (Behrens and Gray, 2001).

Although challenges to undertaking co-production have been identified, this knowledge presents the opportunity to reflect on how co-production impacts on the development of new knowledge and allows more informed decisions about when and how co-production is useful or desirable. Certainly, the collaborative and engaging nature of co-production has appealing synergy with the elements of structural empowerment known to support retention of early career nurses, and as such may have utility as a technique suited to the development of interventions to meet that aim.

1.1.9 Gaps in the evidence about interventions to increase retention of early career nurses

Although the outcomes of interventions to increase retention and decrease turnover of early career nurses in many different settings have been reported, there are several gaps in knowledge about the phenomenon. For interventions implemented during the pre-registration period, there is a lack of knowledge about the types and effectiveness of such interventions for reducing turnover or increasing retention in the first year after qualification. Much of the research focus has been on interventions implemented during the first year of qualified practice and no systematic review has collated evidence about interventions implemented during the educational programmes. For those implemented following graduation, more knowledge is needed about which components of the interventions contribute to their effectiveness. A systematic review conducted in 2008 explored organisational strategies that increased retention of newly graduated nurses (Salt, et al., 2008) but did not evaluate the components of the strategies that may have resulted in that effectiveness, other than programme length. In the intervening decade, no systematic

reviews examining these components have been published and as such represents a gap in the literature.

A further deficit in the evidence relates to the explicit participatory nature of work to design interventions to increase retention of early career nurses and this is an area that requires further exploration. Working in partnership to develop interventions, in this context with nurses and student nurses, is likely to produce more appropriate, pragmatic, and credible intervention designs (Henshall, et al., 2018; Latif, et al., 2017). Increasingly, policy makers attach importance to the incorporation of co-production in policy reform (Horne and Shirley, 2009) and the technique holds promise for the development of interventions to increase retention of nurses. Little is known, however, about the effectiveness, feasibility or acceptability of co-production in this context.

Despite extensive literature about socialisation of nurses into the profession, transition shock, and early career nurse retention, there is a lack of knowledge about: 1) the types and effectiveness of interventions to increase nurse retention implemented in the final year of the nursing education programme; 2) the components of interventions that are effective to increase retention implemented in the first year of qualified practice; 3) the benefits of involving student and early career nurses in the development of interventions to increase retention of early career nurses; and 4) the benefits of co-production as a model to develop interventions.

These gaps formed the rationale for undertaking this PhD study and underpin the aims of the study discussed in this thesis. In particular, the PhD study intended to answer the following research questions: what is the most effective type of intervention to increase retention of early career nurses in the UK and when is the best time to implement it to maximise effectiveness? Is it feasible and acceptable to co-produce an intervention with early career nurses and student nurses? What are the barriers and facilitators to implementing the co-designed intervention with pre-registration nursing students in partnership with one large NHS healthcare organisation in the UK?

The imperative to retain the early career nursing workforce, particularly in inner city areas, is a clear rationale for focus in this area. The outcomes of a study that contributes to filling these gaps in knowledge will benefit nursing students, early career nurses, healthcare workforce employers, and ultimately a stronger nurse workforce will impact positively on patient safety, experience and outcomes.

1.2 The PhD study context

This PhD sits within a larger study funded by the Burdett Trust for Nursing, which aimed to improve retention and reduce burnout for early career nurses. The larger Burdett Trust funded study and the PhD study both aimed to address gaps in current knowledge. The aims and objectives of the larger study are indicated in Table 1, and the relationship between the larger study and the PhD study is illustrated in Table 2.

The larger study involved a partnership between City, University of London and a local NHS organisation, Barts Health NHS Trust. This PhD study drew on the same partnership to explore in greater detail specific areas aligned to the larger study aims and objectives. More detail of the study setting is given in Chapter 3.

Table 1 Aims and objectives of the larger study in which the PhD study was embedded

Aim of the larger project
To develop a new intervention and test feasibility and efficacy in a single organisation for improving nurse retention and reducing burnout with early career nurses.
Objectives of the larger project
1. To identify the components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses. 2. To work collaboratively with students and early career nurses to co-produce an evidence-based intervention 3. To develop the intervention and test feasibility and efficacy in a single site.

4. To identify early career nurses at risk of leaving the profession through assessment of social capital and networks in the profession
5. To explore whether perceptions of work environment change over time and pre and post intervention.
6. To explore whether self-reported scores for mental wellbeing, depression, anxiety, stress, burnout, and resilience change over time and pre and post intervention.
7. To identify changes in employing NHS Trust retention data for early career nurses over time and pre and post intervention.

1.3 PhD study aim

The PhD focused on the co-production and implementation of an intervention to increase retention of early career nurses. The intervention was underpinned by evidence from two systematic reviews, co-produced with early career nurses and student nurses, and evaluated in terms of feasibility and acceptability. Specifically, this PhD focused on objectives 1 – 3 of the larger study.

1.4 PhD study objectives

The objectives for the PhD study were:

1. To identify the types and components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses.
2. To explore how a group of early career nurses and student nurses used current evidence and experience to co-produce an intervention to increase retention and decrease turnover of early career nurses.
3. To explore the experiences of students and early career nurses during the co-production process.

4. To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process.
5. To identify the barriers and facilitators to implementing the intervention.
6. To explore the experiences of students and academic staff during the implementation of the intervention.
7. To establish how the views of students and staff explain the measures of acceptability and feasibility of the intervention

The relationship between the PhD objectives and those of the larger study are illustrated in Table 2.

Table 2 The relationship between the wider study and PhD objectives

Larger study objective	Related PhD study objective
1) To identify the components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses.	1) To identify the types and components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses.
2) To work collaboratively with students and early career nurses to co-produce an evidence-based intervention	2) To explore how a group of early career nurses and student nurses used current evidence and experience to co-produce an intervention to increase retention and decrease turnover of early career nurses. 3) To explore the experiences of students and early career nurses during the co-production process.

	4) To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process.
3) To develop the intervention and test feasibility and efficacy in a single site.	5) To identify the barriers and facilitators to implementing the intervention. 6) To explore the experiences of students and academic staff during the implementation of the intervention. 7) To establish how the views of students and staff explain the measures of acceptability and feasibility of the intervention.
4) To identify early career nurses at risk of leaving the profession through assessment of social capital and networks in the profession.	
5) To explore whether perceptions of work environment change over time and pre and post intervention.	
6) To explore whether self-reported scores for mental wellbeing, depression, anxiety, stress, burnout, and resilience change over time and pre and post intervention.	
7) To identify changes in employing NHS Trust retention data for early career nurses over time and pre and post intervention.	

The PhD study consisted of three parts. Initially a systematic review of the literature was conducted, followed by a two-phase empirical study. Phase 1 of the empirical study involved co-production of the intervention and assessment of acceptability of the process. Phase 2 involved implementation of the intervention and assessment of feasibility and acceptability. Each of the three parts is explored in detail in the remaining chapters of this document and Table 3 indicates where each of the objectives are addressed throughout the thesis.

Table 3 Mapping of objectives against thesis chapters

Objective number	Objective	Chapter/s where objective is discussed
1.	To identify the components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses.	Chapter 2 Literature Review Chapter 6 Discussion and conclusion
2.	To explore how a group of early career nurses and student nurses use current evidence and experience to co-produce an intervention to increase retention and decrease turnover of early career nurses.	Chapter 3 Methodology and methods Chapter 4 Co-production of the intervention
3.	To explore the experiences of students and early career nurses during the co-production process.	Chapter 5 Implementation of the intervention Chapter 6 Discussion
4.	To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process.	Chapter 5 Implementation of the intervention Chapter 6 Discussion
5.	To identify the barriers and facilitators to implementing the intervention.	Chapter 4 Co-production of the intervention Chapter 5 Implementation of the intervention Chapter 6 Discussion
6.	To explore the experiences of students and staff during the implementation of the intervention.	Chapter 5 Implementation of the intervention Chapter 6 Discussion
7.	To establish how the views of students and staff explain the measures of acceptability and feasibility of the intervention	Chapter 5 Implementation of the intervention Chapter 6 Discussion

1.5 Outcomes and outputs

Outcomes of this PhD include:

- A summary of current evidence of the types and effectiveness of interventions implemented in the final year of nurse education programmes to increase retention in the first year after qualification.
- A summary of current evidence of effectiveness of components of interventions to reduce turnover and increase retention of early career nurses
 - This summary has been published as a peer-reviewed publication in the International Journal of Nursing Studies
- A co-designed intervention
 - This intervention was co-designed by students, early career nurses and academic facilitators and implemented with final year pre-registration student nurses.
 - The co-production process acceptability has also been published as a peer-reviewed paper in Nurse Education in Practice.
- Measures of feasibility and acceptability of both the co-production process and the intervention
 - Analysis of the data will inform future implementation. The co-production process acceptability been published as a peer-reviewed paper in the Nurse Education in Practice journal.
 - Implementation feasibility and acceptability has also been published as a peer-reviewed paper in the BMC Nursing journal.

1.6 Summary

This chapter has introduced the importance of nurse retention in the context of the healthcare workforce. The focus of the chapter is on early career nurse retention, describing the current situation regarding interventions to support retention of early career nurses. The information presented highlights gaps in knowledge about the type of interventions that are most effective for reducing attrition from the early career nurse workforce, and lack of certainty about whether these should be implemented pre or post

qualification. The narrative summarises evidence about the influence of the workplace environment on the socialisation of nurses into the profession, and the impact of transition shock on decisions to remain in the profession. The concept of co-production has been introduced, and empowerment and co-production of student and early career nurses are offered as facets of solutions to attrition from the early career workforce. In the chapter, the wider context of this PhD study is described, a rationale for the study is explored, and aims and objectives are introduced. The literature review chapter (Chapter 2) and the methodology and methods chapter (Chapter 3) explore the processes in more detail.

Chapter 2 Literature Review

A range of different interventions have previously been proposed, implemented, and evaluated to increase retention of early career nurses. There are two time points where these interventions can be implemented, either prior to graduation during the educational programme to prepare for and ease the transition into practice, or immediately following qualification in the first year of qualified practice. Several systematic reviews already exist evidencing the effectiveness of interventions implemented in the first year of practice to either ease transition from student to newly qualified nurse or retain nurses in the role or profession (Edwards, et al., 2015; van Rooyen, et al., 2018; Kenny, et al., 2021). There is also some mention of those interventions that are implemented prior to graduation (Wray, et al., 2021). However, initial scoping searches identified two areas that required further clarification, and which were important to inform the development of a novel intervention in the current study:

1. The types and impact of interventions implemented during the undergraduate education programme to increase early career nurse retention; and
2. A systematic understanding of which components of interventions implemented in the first year after qualification contribute to their success.

Consequently, two literature reviews were conducted, the second of which was published and is included as a paper in this literature review chapter. Following the reporting of the two literature reviews, the remaining sections of the chapter consider one type of intervention in more depth (psychological wellbeing programmes) and define the gaps that this study will in part aim to address.

2.1 Literature review 1: Interventions implemented prior to graduation

As discussed in Chapter 1, there is widespread recognition that the transition period spanning the final year of an undergraduate nurse education programme and the first year of qualified practice is a point of high risk for attrition from the profession. This is potentially due to the phenomena of transition shock (Duchscher, 2009), where newly qualified nurses struggle to assimilate the reality of their new roles with their expectations, potentially in the context of low self-efficacy. Consequently, this period has been the focus

of much international research, and there is growing understanding of the factors that influence transition (Kenny, et al., 2021; van Rooyen, et al., 2018). Despite this focus there is little robust evidence of the impact interventions to enhance transition have on retention (Wray, et al., 2021).

In the UK, newly qualified nurses undertake a period of preceptorship in the first few months after taking a newly qualified nurse role. Whilst this has been the recommendation of the Nursing and Midwifery Council for nearly 30 years, it is only recently that the NMC has published principles to guide implementation and standardise the preceptorship experience for newly qualified nurses (NMC, 2020). The NMC does however, stop short of mandating preceptorship, leaving the door open for employers to choose how they can best support newly qualified nurses. Organisation-specific preceptorship programmes may be compromised due to pressures from staffing deficits, workload pressures, or lack of preceptors (Whitehead, et al., 2013; Wray, et al, 2021), potentially impacting on the support that transitioning nurses receive. The RePAIR report (HEE, 2018) identified the need for preceptorship programmes to be designed and implemented in the context of tripartite commitment, encompassing the higher education institute, the healthcare provider clinical education environment, and the newly qualified nurse. These principles are to some extent reiterated in the NMC document (NMC, 2020) as the preceptee and the preceptor are encouraged to work in partnership to influence the content and length of their preceptorship to meet individual need. This position of preceptee empowerment fits comfortably with the evidence that empowerment leads to increased job satisfaction and ultimately retention. Preceptorship is the current advocated support mechanism for early career nurses in the UK, but a review of the evidence base was necessary as a preliminary phase of this PhD study to understand whether it is the most appropriate or only support intervention that would be useful to ease transition and increase retention.

This PhD study was designed to develop and implement an intervention to increase retention of early career nurses. To support that outcome the literature review aimed to understand what interventions have targeted student nurses with the goal of reducing likelihood of leaving once working as early career nurses, what they tried to do, and what evidence there was of their success. In addition, the selected papers were scrutinised for

information about how the interventions were developed, to inform the development process of the intervention for this study.

On conducting the literature review, it became apparent that there were few papers that met the inclusion criteria. However, there was a wider body of literature that did not include pre-post retention data, and therefore did not measure effectiveness, but was useful to inform development of the intervention in this study. The included papers provided a narrow perspective, consequently review of the wider body of literature was important to add context and a broader perspective. The systematic literature review undertaken is reported below, followed by a narrative summary of the wider literature.

2.1.1 Method

Initial scoping searches were conducted through Google Scholar and the Cochrane Library, to identify whether a systematic review exploring the same topic had been conducted. Literature searches and study selection for this review were then conducted using processes aligned to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (Moher et al., 2009).

2.1.1.1 Eligibility Criteria

Studies were required to meet the following criteria to be eligible for inclusion in the systematic review: peer-reviewed journal articles published in the English language between 2001 and 2021. A 2001 parameter was applied to ensure currency of findings given the significant changes to nurse education prior to this time. Studies were included in the systematic review if they reported primary research on interventions implemented during the final year of a pre-registration nursing programme, were designed to increase retention of early career nurses, and reported retention data over at least two points. Studies that did not report retention data were included in the narrative review.

2.1.1.2 Search Strategy

Search terms were based on a PICO structured question, focusing on P (population) I (intervention) and O (outcome). Groups of search terms were used and then combined using the Boolean operators AND and OR including: (retention, attrition, turnover,

transition, qualify, qualification, progress, progression) AND (student, trainee, graduate) AND nurs* AND (program*, project, intervention). All terms were used in each database. Limits were imposed around date of publication and publication language in accordance with the eligibility criteria.

2.1.1.3 Data Sources

Medline and CINAHL were chosen as the most appropriate databases to search, due to the relevance of the database content description. The reference lists of relevant systematic reviews were used to identify further studies. Searches were conducted between August 2021 and October 2021.

2.1.1.4 Study selection and data extraction

Duplicate papers were removed, and studies were screened against the inclusion and exclusion criteria for eligibility, based on the abstract and title. Discussions between the doctoral researcher and a supervisor (JB and LA) took place where there was uncertainty about eligibility, and the paper was downloaded and read in full to facilitate an agreed decision. Full papers for all tentatively included studies were downloaded and scrutinised by the doctoral researcher using a specifically created screening tool to confirm that the studies met the inclusion criteria. Any ambiguous studies were discussed with a supervisor (LA) and assessed as either eligible or ineligible.

Eligible studies were subjected to data extraction and synthesis. These papers addressed issues of retention and reported quantitative data on at least two occasions for comparison (e.g., pre-post data, time series design, RCT, equivalent or non-equivalent control). Studies that did not meet the inclusion criteria but were of significance to the study were included in the narrative synthesis. These papers addressed issues of transition and/or retention and reported qualitative data on student experience, or quantitative retention data with no comparison group. Papers in the systematic review were quality appraised and reported as a quantitative report of retention data.

2.1.1.5 Quality Appraisal

All studies included in the systematic review were quality appraised using the Joanna Briggs Institute (JBI) checklist for quasi-experimental studies, which asks 9 questions. Each paper was awarded a quality assessment score by adding the total number of positive responses. Studies only included in the narrative synthesis were not quality appraised, due to the heterogeneity of the literature selected. Lack of quality appraisal is noted as a limitation to the inferences that can be made.

2.1.1.6 Data Extraction

A data extraction sheet was designed and used to extract the relevant information from the eligible studies. This included: 1) author & year; 2) country of study; 3) study design and methods; 4) study objectives; 5) intervention used; 6) participant sample size and characteristics; 7) outcome measures; 8) retention data; 9) other outcomes.

2.1.1.7 Data synthesis

Following data extraction and quality appraisal, key features and findings of included studies were reviewed and iteratively discussed by the doctoral researcher and a supervisor (JB and LA) to establish the structure of the synthesis of the study findings. Due to the heterogeneity of the studies and the nature of the question, meta-analysis was not performed. Instead, a quantitative summary of the effect of the different interventions on retention was conducted. Specific detail such as sample size, intervention design, and effect, are presented in Table 4 and 5.

Retention data were used to guide the comparison between studies. The change in retention was calculated by subtracting the pre-intervention/comparison group data from the post-intervention/target group data. Retention data are presented as a percentage, as this was a common method of presentation in all papers included in the systematic review, and some detail of control group sample size was not present in the papers, which limited the potential to present source data.

Data extracted from papers included in the narrative synthesis were collated and synthesised. This method was chosen due to the heterogeneity of the interventions and

study designs reported, and the limited opportunity to pool data statistically (Ryan and Cochrane Consumers and Communication Review Group, 2013).

2.1.2 Results

The results of the literature searches, critical appraisal, and qualitative and narrative synthesis are presented in the following sections. The results for the systematic review are presented initially, followed by the results of the narrative synthesis.

2.1.2.1 Identification of papers

A total of 1744 papers were identified through database searches, and an additional 13 papers were found from the reference lists of identified studies (Figure 1). Duplicates were removed, and remaining papers were screened by abstract and title. After applying eligibility criteria to abstract and title, 179 papers remained for full text assessment. A further 146 papers were excluded, leaving 33 papers for inclusion in the review, 6 papers that met the criteria for the systematic review, and seventeen papers that met the criteria for the narrative synthesis. Figure 1 illustrates the study selection process in the form of a PRISMA flowchart (Moher, et al., 2009). Included studies are outlined in Table 4 and Table 5, including turnover and retention data where present, and additional findings for the 33 studies.

2.1.2.2 Critical Appraisal

Due to the low number of studies that met the inclusion criteria for the systematic review, no studies were excluded based on quality appraisal. The inferences that could be made were therefore limited by the quality of the reporting. All six papers were appraised using the JBI checklist for quasi-experimental studies. Out of a total potential score of 9 for quasi-experimental studies, one study scored 7 (Tseng, et al., 2013), three scored between 4 and 6 (Cantrell and Browne, 2006; Friday, et al., 2015; Meyer, et al., 2017), and two studies scored 3 (Kropkowski and Most, 2008; Trice, et al., 2007). The low appraisal scores were influenced by an absence of information. Only one study (Tseng, et al., 2013) reported how retention was calculated, which lead to doubt about the consistency and reliability of the measurements in those studies where this was not explicit. In all six studies, the cause and effect were clear, and a control or comparison group was identified. Three of the six studies provided detail about the similarity of participants in comparison groups (Friday, et al.,

2015; Meyer, et al., 2017; and Tseng, et al., 2013) but only two of the six studies reported more detail about the comparison groups, making it difficult to ascertain their similarity of experience outside of the intervention (Friday, et al., 2015; Tseng, et al., 2013). Two studies reported detail of follow up (Meyer, et al., 2017; Trice, et al., 2007).

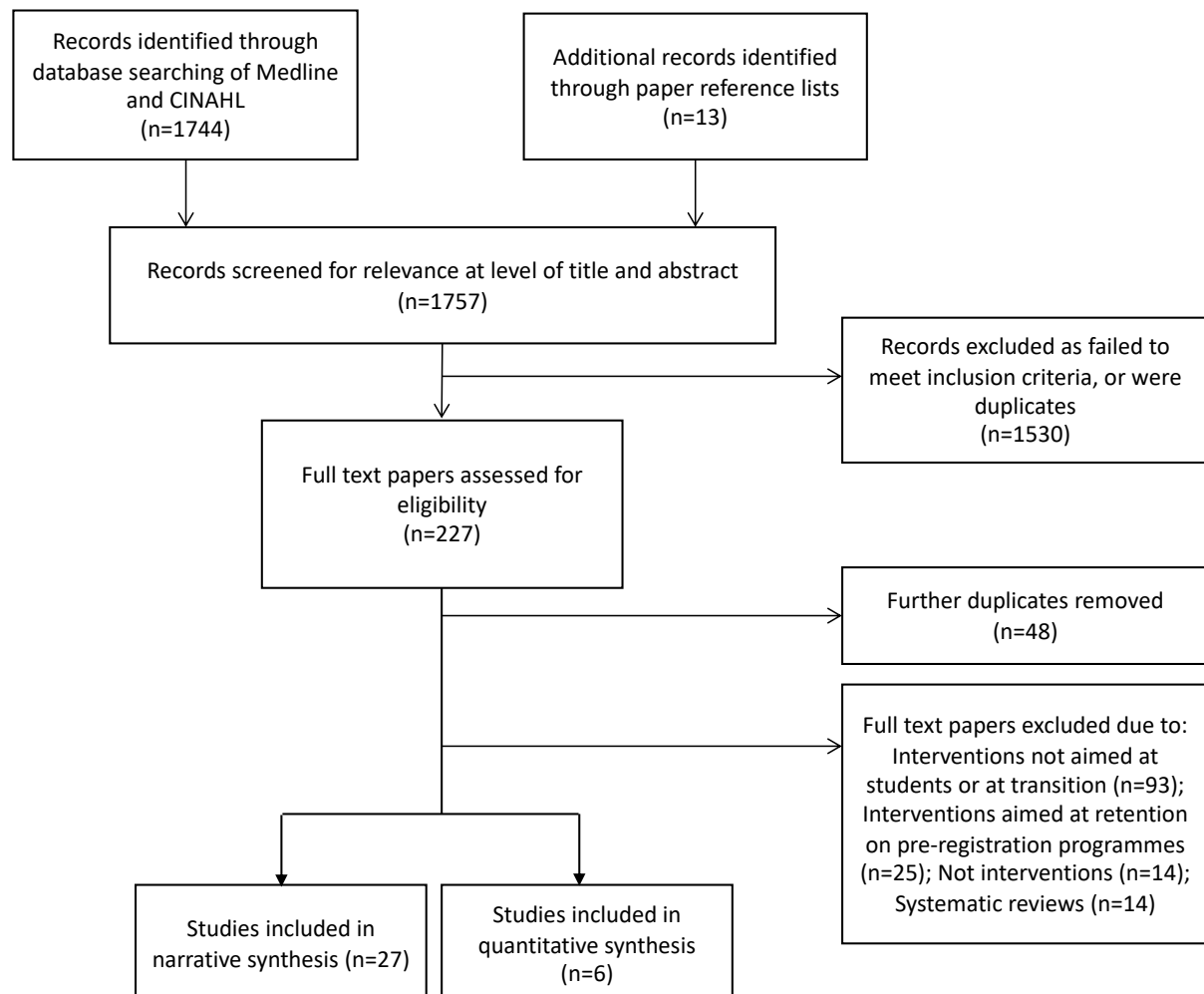


Figure 1 PRISMA Flow diagram (Moher, et al., 2009) of literature search and results

Table 4 Systematic review studies: quantitative synthesis of retention data (n = 6)

Author, Year & Country	Design	Sample Size for retention /turnover	Quality Score	Intervention	Duration of intervention	Main Findings in relation to retention and turnover	Additional Findings
Cantrell and Browne 2006, USA	Non-equivalent control group posttest only	193 newly graduated nurses who had undertaken the externship (intervention group) Control group size not clear – all graduates who did not undertake the externship	4/9	Summer nurse externship program	10 weeks	3% increase in retention compared to comparison group at 12 months Of the 193 nurses who completed the externship, 153 accepted a graduate nurse position at the institution Intervention group vs Control group (graduate nurses who did not do an externship; 1998-2003) Average turnover from 1998 to 2003 for externs was 22.83 Institution wide average turnover from 1998 to 2003 for qualified nurses was 14% The intervention group had higher average turnover than the wider hospital workforce, but this decreased from 44% to 5% over 6 years of the externship.	None reported.

Friday, et al 2015, USA	Non-equivalent control group posttest only	20 newly graduated nurses who had undertaken the externship and residency program (intervention group) 40 newly graduated nurses who just undertook the residency program (control group)	5/9	Pre-licensure extern program and post licensure residency program	Unclear	4% decrease in retention at 1 year and 14% decrease at 2 years compared to non-extern group. Overall retention on residency program was 95% at 1 year and 85% at 2 years. For the extern group 1 year retention rate was 92% and the 2 year rate was 77%. The non-extern group 1 year retention rate was 96% and the 2 year rate was 91%. Retention rate for extern group was higher than national average but dropped to 68% at 30 months.	Participants were also surveyed for five additional factors: support, patient safety, communication /leadership, professional satisfaction, and job satisfaction, using the Casey-Fink Nurse Experience Survey. The results showed no statistically significant difference between those who attended the externship and the residency programme and those who just attended the residency programme.

Kropkows ki and Most 2008, USA	Non- equivalent control group posttest only	49 students over 4 years undertook the externship (intervention group) Control group size not clear – all graduates who did not undertake the externship	3/9	Extern program for senior nursing students	Up to 1 year	34% increase in retention at 1 year compared to non-externs 80% of the nurse externs took full-time nursing positions in the hospital in the first year and 75% of the first group of nurse extern graduates remain employed 2 years later. 88% of the 49 externs who completed the program between 2004 and 2008 have been recruited to positions in the hospital. The 1-year average nurse extern retention rate is 86%. By comparison, 52% of the new graduates who weren't nurse externs and hired in the same year currently remain employed.	Saving of \$228,915 for 10 nurse externs that remain at the hospital for 1 year, due to elimination of agency nurses and decreased orientation. Qualitative survey feedback: • Enhanced experiences encountered in school. • All externs viewed the program as a means of providing a stronger clinical knowledge base as a new RN. • All externs would recommend the program to classmates. • Most externs learned the importance of role delineation. • Externs received superior technical and behavioural ratings in the second year of the program. • Program assists them in assessment, documentation, and time management while improving self-confidence. • Learning unit expectations, policies, and procedures prepares them for the career decisions they must make upon graduation.

Meyer, et al 2017, USA	Non-equivalent control group posttest only	53 students undertaking the revised education programme (intervention group) 61 students who undertook the traditional education programme (control group)	6/9	Curriculum revision for final year students, including additional simulation, quality improvement course, transition to practice course. and a nursing immersion practicum	Up to 1 year	At 6 months, 11% increase in retention compared to comparison group. At 12 months, 6% decrease in retention compared to comparison group (not statistically significant). At 6 months, 29 members of the control group (70%) were in the same job, and 5 (12%) had changed jobs (7 participants had no job at the time of the 3-month survey). For the experimental group, 36 individuals (81%) were in the same job they had 3 months before, whereas 3 (6%) had changed jobs (5 participants had no job at the time of the 3-month survey). At 12 months, 34 respondents from the control group (88%) and 37 of those in the treatment group (82%) were in the same job they had at 6 months.	Participants were also surveyed using the Casey-Fink Nurse Experience Survey. The participants in the treatment group reported higher professional satisfaction than those in the control group ($P = .005$). At 3 months postgraduation, participants from the new curriculum were more likely to recommend nursing to others, indicated higher professional satisfaction, and were more likely to state that they were glad they chose nursing as a career. Graduates who left their positions before 12 months had lower overall Casey-Fink scores at 3 months than those who stayed in their same jobs 12 months postgraduation. By 12 months postgraduation, there was no significant difference between the 2 groups when looking at both their educational satisfaction and Casey-Fink transition-to-practice scores. From 3 months, the practice environment may be the most influential factor for both

							professional satisfaction and positive transition to practice.
Trice et al 2007, USA	Non-equivalent control group posttest only	38 newly graduated nurses who had undertaken the externship (intervention group) 28 newly graduated non-extern nurses (control group)	3/9	Summer extern program	12 weeks	Increase in retention of 21% over first two years compared to non-extern group. The major reasons for nurse attrition are pregnancy and the transfer of a spouse to a different location.	The average age of the nurses in the OR at the medical centre is 37 years, compared with a national average age of 48 to 49 years. Of the perioperative nursing staff members, 60% have a minimum of a baccalaureate degree compared to 40% to 45% of nurses in the rest of the hospital. Staff members and physicians have become more committed to the success of the student externs and interns.
Tseng, et al 2013, Taiwan	Non-equivalent control group Pretest posttest	19 student nurses completing the externship (comparison) 24 student nurses completing the corporate academic cooperation program (intervention)	7/9	Corporate-academic cooperation program (CACP) and externship program (EP)	Externship: 4 weeks plus additional study CACP: 4 weeks plus additional study jointly delivered by academics and practitioners	39% increase in retention for CACP group compared to externship at 3 months and 37% higher at 1 year. The retention rate declined over time in both groups. Three months and 1 year after beginning employment, the retention rates were 52.6% and 42.1% for the externship group and 91.7% and 79.2% for the CACP group, respectively. Over time, the retention rate in the CACP group was significantly higher than that in the externship group	Also surveyed using the 6-dimension scale for nursing competence (Schwirian, 1978). The CACP group achieved significantly higher scores than the EP group following practicum training across all 6 subscales.

2.1.2.3 Systematic review papers study characteristics

Six studies were included in the systematic review. Five of the studies were conducted in USA, and one in Taiwan. All six of the interventions were designed to target student nurses in the final year of their undergraduate pre-registration programmes of education.

The intervention provider or study settings consisted of acute hospitals or medical centres in the USA or Taiwan, with one setting specified as a paediatric hospital (Cantrell and Browne, 2006). One intervention was delivered in a university School of Nursing (Meyer, et al., 2017), and one was delivered as a partnership between a hospital and a local university (Trice, et al., 2007).

Five out of the six studies provided data on the number of nurses taking part in the intervention, and sample sizes ranged from 19 to 193, with a median of 60.5 (IQR 38.5). Retention was reported in all six studies, and one study reported both retention and turnover data (Cantrell and Browne, 2006).

2.1.2.4 Systematic review findings

The summary below offers a more detailed exploration of each of the studies, including the types of intervention described, intervention development, where this is available, and other key findings from the studies.

Five of the six studies described outcomes of externship programmes, implemented either prior to a post-qualification residency programme (Friday, et al., 2015) or internship (Trice, et al., 2007), or in isolation (Cantrell and Browne, 2007; Kropkowski, et al., 2008). One study (Tseng, et al., 2013) used students undertaking an externship as a comparison group to explore the effect of a corporate academic cooperation programme. The sixth study (Meyer, et al., 2017) implemented a revised undergraduate curriculum, incorporating changes that focused on transition to practice in the final year of the programme.

The effect of externships on retention was mixed, and given the variation in sample size, the percentages quoted must be considered with caution. Three of the five studies demonstrated an increase in retention of participants in externships compared to the

comparison groups (Cantrell and Browne, 2006; Kropkowski, et al., 2008; and Trice, et al., 2007). Kropkowski, et al., (2008) also calculated a saving of \$228,915 for every 10 nurse externs that remain at the hospital for 1 year, due to lower requirement for agency nurses and a decreased length of orientation for externs who went on to work in the same area. Trice, et al., (2007) also found positive changes in the demographics of the clinical area over the period of the externship implementation, including a reduction in average age of nurses in the centre, compared to the national average, and a higher level of academic qualification in relation to the rest of the hospital.

Two of the studies focusing on externships reported negative outcomes. Friday, et al., (2015) found that the non-extern comparison group had higher retention rates, with increased difference between the two groups at 12 months post qualification. Additional data collected using the Casey-Fink Graduate Nurse Experience Survey (Casey, et al., 2004), led the authors to conclude that consideration should be given to the cost-effectiveness of providing an externship in addition to a residency programme as the combination did not necessarily improve new nurses' perceptions of support, job satisfaction, or retention rates. Tseng, et al., (2013) compared an externship programme with a Corporate Academic Cooperation Programme (CACP). This is a programme of study and practical experience that is planned and delivered jointly by academics and healthcare organisation staff. New graduates were also surveyed using the 6-dimension scale for nursing competence (Schwirian, 1978). Over time, the retention rate in the CACP group was significantly higher and students who participated in the CACP group achieved a statistically significant improvement in nursing competence, compared to those in the extern group. However, the group numbers were small (19 extern group and 24 CACP group), which impacts on the generalisability of the findings.

The final study (Meyer, et al., 2017) considered the effect of changes to the undergraduate nursing programme on transition to practice, and measured retention rates, job satisfaction and graduate experience. At six months, the authors found an 11% increase in retention compared to comparison group, and at 12 months, there was a (non-statistically significant) 6% decrease in retention compared to comparison group.

Overall, the six studies report varied outcomes, making inferences difficult to draw. All six studies reported retention data as a percentage, and this was the only potential point of comparison due to missing data about control group size in some studies. Although all six studies reported retention data, the variation in sample size means that the percentage provides a limited illustration of effect size across studies, with retention or attrition of one extra nurse in smaller samples resulting in a higher percentage loss or gain than in larger samples.

All six studies were undertaken outside of the UK, five in the USA and one in Taiwan. The pre-registration undergraduate nursing programmes in the USA and Taiwan have significant differences in structure and content to those in the UK, largely due to a different proportion of learning in clinical environments to learning in academic environments. The impact the interventions may have on the retention of early career nurses in the UK, or other countries, is therefore difficult to assess.

The review of these studies does not indicate consensus about the benefits of implementing interventions during the final year of the pre-registration programme with the aim of increasing early career nurse retention. Although five of the papers reported outcomes on externships, two of those papers reported negative or less positive outcomes for retention. It is therefore important to explore the wider literature to understand the potential benefits of implementing interventions at this point in the transition from student to qualified practitioner.

2.1.2.5 Narrative Synthesis Study Characteristics

Twenty-seven studies were included in the narrative synthesis. The studies were conducted in a range of countries, with the majority (n=12) from the USA (Bay, et al, 2018; Cantrell, et al., 2005; Cantrell and Browne, 2005; Dela Cruz, et al., 2013; Difenbeck, et al., 2006; Epstein, 2007; Gregory, et al., 2014; Kim, 2007; Messina, et al., 2011; Starr and Coney, 2006; Steen, et al., 2011; and Wieland, et al., 2007). Other sources were Australia (n=3) (Frotjold, et al., 2007; Nash, et al., 2009; and Usher, et al., 2015), UK (n=3) (Broad, et al., 2011; Christiansen and Bell, 2009; and Stacey, et al., 2017), Canada (n=3) (Callaghan, et al., 2008; Christensen, 2005; and King, et al., 2009), New Zealand (n=1) (Pullon, et al., 2016), Hong Kong (n=1)

(Chung, et al., 2008), Italy (n=1) (Cheli, et al., 2020), Pakistan (n=1) (Farooq, et al., 2015), Colombia (n=1) (Courtney, 2005), and Taiwan (n=1) (Jiang, et al., 2012). All 27 interventions were designed to ease transition from student nurse to qualified practitioner and were implemented during the final year of the undergraduate nursing education programme.

The interventions were provided by or implemented in acute hospitals or medical centres, often working in partnership with a university or school of nursing to implement the interventions. Seven of the studies described the primary study setting as an acute hospital with no mention of partnership with academic organisations (Cantrell et al., 2005; Cantrell and Browne, 2005; Courtney, 2005; Christensen, 2005; Chung, et al., 2008; Kim, 2007; Nash, et al., 2009) and one (Pullon, et al., 2016) was conducted in a rural area of high need, which may or may not have been an acute hospital setting. Given the fact that all the interventions involved student nurses, it is unlikely that there was no relationship between the academic university or school of nursing, but the nature of the relationship is not reported in the papers. Nine of the studies report the intervention setting to be both an acute setting and a university or school of nursing (Bay, et al., 2018; Broad, et al., 2011; Dela Cruz, et al., 2013; Jiang, et al., 2012; King, et al. 2009; Stacey, et al., 2017; Starr and Conley, 2006; Steen, et al., 2011; and Weiland, et al., 2007). The remaining ten papers described the study setting as the university or school of nursing, with no mention of partnership with healthcare organisations (Callaghan, et al., 2008; Cheli, et al., 2020; Christiansen and Bell, 2009; Difenbeck, et al., 2006; Epstein, 2007; Farooq, et al., 2015; Frotjold, et al., 2007; Gregory, et al., 2014; Messina, et al., 2011; and Usher, et al., 2015). As there is disparity in the arrangements for clinical practice between programmes of study for nurses in different countries, it is difficult to ascertain the level of partnership the school of nursing or university may have with the acute hospital setting.

The papers described studies using qualitative, quantitative, and mixed methods. The qualitative studies (n=13) (Bay, et al., 2018; Broad, et al., 2011; Cantrell and Browne, 2005; Christiansen and Bell, 2009; Courtney, 2005; Difenbeck, et al., 2006; Epstein, 2007; Gregory, et al., 2014; Jiang, et al., 2012; Messina, et al., 2011; Stacey, et al., 2017; Starr and Conley, 2006; and Weiland, et al., 2007), used case study design, phenomenology, or narrative evaluation techniques to conduct their research and report their findings. Several of the

qualitative studies, particularly those published prior to 2010, were written in the form of a narrative report, rather than in the style encouraged by the publication of contemporary reporting guidelines, for example by the Equator Network (Tong, et al., 2007; O'Brien, et al., 2014). Consequently, absence of detail made comparisons and conclusions difficult to draw.

Eleven of the papers described quantitative studies, which varied in design and included one pilot non-randomised control trial (Cheli, et al., 2020), six cross-sectional survey studies (Callaghan, et al., 2008; Farooq, et al., 2015; Frotjold, et al., 2007; Kim, 2007; Steen, et al., 2011; and Usher, et al., 2015), and four quasi experimental studies (Cantrell et al., 2005; Dela Cruz, et al., 2013; King, et al. 2009; Pullon, et al., 2016;). The three mixed methods studies (Christensen, 2005; Chung, et al., 2008; Nash, et al., 2009) incorporated quantitative survey data collection with qualitative data collected via interviews, focus groups, or reflective journals. Of the 11 quantitative studies and 3 mixed methods studies, sample size was described in nine studies. Sample size ranged from 22 to 111, with a median of 82 (IQR 42).

2.1.2.6 Narrative synthesis findings

In this group of papers, only five of the studies reported retention data (Courtney, 2005; Dela Cruz, et al., 2013; Messina, et al., 2011; Christensen, 2005; Gregory, et al., 2014), but in all cases, this was reported without a comparison group or pre-post data. Consequently, these studies were not included in the systematic review. All five studies reported increased retention following the interventions, but this was based on as few as two early career nurses, or unsupported by data.

Due to the lack of retention data in the wider group of studies, the findings have been reported according to intervention type, with consideration of key findings related to transition to practice, rather than a narrower focus on retention. All studies aimed to ease transition from student to qualified practitioner and given the evidence to indicate the influence that transition has on decisions to stay or leave the role or profession (Wray, et al., 2021), these additional findings were deemed relevant to the aims of the review.

The studies were categorised according to one of six descriptors that indicated at high level the type of intervention that was implemented. These categories were: capstone project; internship; externship; preceptorship; psychological wellbeing programme; and other. The 'other' category covered individual interventions that were described by only one study and could not be categorised as above. In reality the categories do not have strict boundaries, and interventions assigned to each category vary in characteristics, duration, content and delivery mechanism. The findings for each of these categories are summarised below.

2.1.2.7 Externships

Four of the papers reported interventions that were described as externships, all four were conducted in the USA, indicating that externship is a term used primarily in this country. Two of these reported different aspects of the same research study (Cantrell, et al., 2005; Cantrell and Browne 2005), which is also reported by one of the papers in the systematic review (Cantrell, et al., 2006). This study used a case control design, with additional qualitative data collection via focus groups. Their quantitative results indicate that there was no support for the hypothesis that participating in the externship made a positive difference to job satisfaction, sense of belonging, professionalism, or role socialisation. However, qualitative findings support the benefit of externships for providing a clear and realistic understanding of the complexities of nursing care and the healthcare environment, and the responsibilities inherent in the role. The authors suggest that this in turn provoked anxiety for participants about the process of transition from student to qualified nurse, which impacted on their confidence.

Gregory, et al., (2014) report the implementation of a perioperative externship for senior undergraduate nurses. They reported high levels of satisfaction reported by student nurses, who felt better prepared for their nursing career, and learned about assessment, patient safety, teamwork, and advocacy. In addition, increased interest from new graduates in perioperative nursing led to decreased agency nurse spend and a decrease in the average age of nurses in the clinical area. Findings from the qualitative study reported by Starr and Conley (2006), reiterate the positive benefits of a summer externship as understanding of and development into the nursing role, attributed to gaining critical thinking skills. Recognition as a team member was perceived as a major benefit by participants, which in

contrast to findings from Cantrell and Browne (2005), increased self-confidence and decreased stress.

One additional paper (Courtney, 2005) describes a perioperative externship implemented in Colombia as a precursor to a pre-graduation internship. This described increased confidence when providing care to surgical patients, and decreased costs associated with orientation and training once students were employed in the area. Due to the combination of internship and externship it is not possible to determine which had the greater influence.

2.1.2.8 Clinical immersion programmes

Eight of the papers report interventions described as clinical immersion programmes (Christensen, 2005; Chung, et al., 2008; Difenbeck, et al., 2006; Frotjold, et al., 2007; Jiang, et al., 2012; Messina, et al., 2011; Pullon, et al., 2016; and Wieland, et al., 2007). The papers were published in a variety of countries (but not the UK), indicating that clinical immersion is concept familiar to nursing communities internationally. The duration of the clinical immersion ranged from 14 hours over 7 weeks, to a maximum of 12 weeks (mean 5.8 weeks), but as all reported positive outcomes, and not all quantified time spent in the clinical environment, it is difficult to determine whether duration influenced outcome.

Three of the studies aimed to increase knowledge, interest, and recruitment to perioperative or high dependency nursing (Christenson, 2005; Frotjold, et al., 2007; Messina, et al., 2011). All three reported successes with recruitment, and in addition, Frotjold, et al., (2007) found that clinical immersion helped to connect theory to practice, and Messina, et al., (2011) found students perceived an improvement in their technical and communication skills. A further benefit was reduced recruitment costs, but as this clinical immersion was open to qualified nurses as well as students it was not possible to determine how much saving could be attributed to student interest.

One study (Pullon, et al., 2016) reported an interprofessional clinical immersion project that brought together students from several healthcare disciplines over five weeks to prepare them better for transition to practice, when they would be required to work as a

multidisciplinary team. This case-control study indicated high student satisfaction and increased understanding and knowledge compared to the comparison group.

Four of the studies describe the clinical immersion as incorporating, or aligning with, a preceptorship (Christensen, 2005; Difenbeck, et al., 2006; Jiang, et al., 2012; Wieland, et al., 2007). Most report positive outcomes in relation to transition to practice from the preceptor element, but Jiang, et al., (2012) describe students' feelings of new experience overload, loneliness, stress, and concern about strict preceptors, suggesting that the context of the clinical immersion may be influential on the outcome. Both Chung, et al., (2008) and Wieland, et al., (2007) found students had enhanced confidence and competence by the end of the clinical immersion, although it was not clear the extent this could be attributed to preceptor element.

Across all studies there is acknowledgement that increased immersion in a clinical environment in the final year of the undergraduate programme gives the students the opportunity to experience the reality of the nursing role and they report acting and feeling more like a nurse at the end of the experience. The influence of different clinical environments, individual preceptors, and length of the clinical immersion on effectiveness, warrant further exploration.

2.1.2.9 Internships

Two papers describe internships (Steen, et al., 2011; Dela Cruz, et al., 2013), both implemented in the USA, where internships are an established element of the post-graduation year for newly qualified nurses, but relatively novel in undergraduate programmes. Steen, et al., (2011) used a cross sectional survey design to understand the effect an internship had on transition from student to registered nurse. Students reported increased confidence with nursing tasks and liaising with patients and families. This was reiterated by Dela Cruz et al., (2013), who also found increased competence with ethical and moral decision making following a 300-hour internship specifically for students undertaking nursing as a second career.

2.1.2.10 Capstone projects

Three papers report the implementation of a capstone project. Two were implemented in the USA (Bay, et al., 2018; Epstein, 2007), and one in Australia (Usher, et al., 2015). Bay, et al. (2018) and Epstein (2007) describe positive outcomes with students achieving their chosen career choice following completion of the capstone and finding the experience positive and interesting. Epstein (2007) acknowledged the need for more rigorous testing. Usher, et al., (2015) reported a less positive outcome in their case-control study, as pre-registration students' perceptions of preparedness for practice did not increase significantly following participation in the capstone project. In contrast, confidence decreased as students were assigned larger numbers of patients.

2.1.2.11 Preceptorships

Although several of the interventions included a preceptor element, only two were described as preceptorship programmes. In the UK, preceptorship is a postgraduate activity, however in other countries, such as the USA, it may be implemented pre-registration. Farooq, et al., (2015) describe preceptorship as a novel intervention in pre-registration nursing programmes in Pakistan and evaluated its use as a model of supervision in the final year 6-week clinical placement. The model was well received by students and recognised as a helpful approach to bridge theory and practice, utilise role modelling to develop professionalism, and as a mechanism for continuous support. Kim, (2007) reports on a 160-hour preceptorship programme in the final year of study. They identified a correlation between participation in the programme and improvements in students' perception of their nursing competence, particularly around organising, collaborating, delegating, initiating nursing care, communicating, and attainment of new knowledge.

2.1.2.12 Psychological wellbeing programmes

Two papers report studies that offered students the opportunity to engage with psychological wellbeing programmes, with the intention that this will enable them to cope better with the challenges that they may face as qualified practitioners. Cheli, et al., (2020) conducted a non-randomised controlled trial to establish the effectiveness of a mindfulness-based education programme incorporated into an undergraduate nursing curriculum in Italy. The programme ran over six weeks and students had a significant increase of

dispositional mindfulness and a significant decrease in perceived burnout following the programme. This led the authors to recognise the potential benefit of incorporating the programme into the pre-registration curriculum. Given the known links between burnout and attrition from the nursing profession (Epp, 2012; Borritz, et al., 2006), such an intervention holds promise for promoting early career nurse retention. The second study (Stacey, et al., 2017) was conducted in the UK and used qualitative methods to evaluate an intervention aimed at supporting students to develop resilience-based competencies that would help them to cope with stress and monitor their own wellbeing. The authors reported a positive impact on students' competency with self-care, which was maintained six months after graduation, despite the complexities of working as a qualified nurse. In addition, the study found that participants were able to externalise the limited resources they encountered in clinical areas as organisational failings, rather than personal inadequacy. Resilience-based competencies have the potential to support newly qualified nurses to recognise and appropriately deal with workplace stressors, with a positive impact on personal stress levels. Although retention outcomes for participants were not measured, this too holds promise as an intervention that may impact on attrition from the role caused by stress-related factors in the workplace.

2.1.2.13 Other

The final category of interventions is a collection of papers that report individual interventions not easily defined under the previous headings. The category consists of five papers, two from the UK, including a transition module delivered as a partnership between the university and clinical area (Broad, et al., 2011), and a peer learning partnership between first and final year students (Christiansen and Bell, 2009). Two were implemented in Canada, including a Collaborative Learning Unit, which again fostered a partnership between the university and the clinical area (Callaghan, et al., 2008), and a critical care bridging programme (King, et al., 2009), which aimed to prepare students to work in critical care areas once qualified. The final paper described revision of an Australian nursing curriculum (Nash, et al., 2009) with the aim of facilitating effective transition from student to qualified practitioner. All studies reported positive outcomes, particularly increases in confidence with nursing practice (Broad, et al., 2011; King, et al., 2009; Nash, et al., 2009; Callaghan, et al., 2008), increases in self-esteem (Christiansen and Bell, 2009); and the

development of significant relationships (Broad, et al., 2011; Callaghan, et al., 2008; Christiansen and Bell, 2009; Nash, et al., 2009). Key to several of the studies (Broad, et al., 2011; Callaghan, et al., 2008; Nash, et al., 2009) was the collaborative development of the interventions by academic and clinical staff.

Table 5 Studies included in narrative synthesis (n=27)

Author, Year & Country	Design	Intervention	Duration of intervention	Number of people undertaking intervention	Sample size	Findings in relation to retention and turnover	Additional findings
Courtney, T. 2005, Colombia	Qualitative descriptive evaluation	Extern / intern programme in OR dept.	Externship: 140 clinical hours plus classroom teaching Internship: 2 x 80 hours of teaching	9	9	6 out of 9 students were retained (no comparison data)	Students reported greater confidence and decreased levels of uncertainty when providing care to surgical patients. Reduced costs associated with orientation and training.
Dela Cruz F,A., Farr, S., Klakovich M, D., Esslinger P. 2013, USA	Pre and post quasi experimental Cohort study	SCAN programme (Second Careers and Nursing Programme) - includes a 300-hour internship	300-hour internship and other aspects	242 students over 9 cohorts	68 out of 74 students from cohorts 1-4	92% of students who completed the prelicensure phase worked as RNs and 88% proceeded to the program's graduate phase. All students from cohorts 1-4 found RN jobs, most in the hospitals where they spent their 300-hour internship.	Employers rated students as highly competent on communication skills and ethical and moral decision making.
Messina, B.A., Ianniceiello, J.M. and Escallier, L.A. 2011, USA	Descriptive survey evaluation	Introductory operating room experience for senior students and capstone course	2-week introduction and 15 weeks capstone practicum	Not clear – 7 on first course but subsequently more	Not clear	2 students from first 15-week course were hired on graduation. 8 nurses from the 15-week program have been hired over 3 years. 7 remain in employment in OR	Students enjoyed providing emotional support and education to patients, the structured OR environment, and honed their communication and technical skills. The institution saved \$264 in nurse recruitment costs and the facility saved \$288 through not needing to re-interview applicants.

Bay, E., Sherzer, A., Darnbrook, E. 2018, USA	Qualitative case study	Capstone immersion course in critical care	15 weeks, 260 clinical hours	80 students per semester	Not clear	Not clear	90% of students achieved their leading career choice.
Broad, P. Walker, J., Boden, R. and Barnes, A. 2011, UK	Qualitative case study	Pre-registration transition module-partnership between the university and the trust.	Not clear	2 cohorts of students (not clear the size of the cohort)	Not clear	Not measured	Students felt more confident embarking on their new role, particularly around medicines management, planning, organisation, and prioritisation of patient care.
Callaghan, D., Watts, W., McCullough, D., Moreau, J., Little, M., Gamroth, L. and Durnford, K. 2008, Canada	Retrospective, cross-sectional study	Collaborative Learning Unit and Preceptorship	Not clear but possibly one year	Not clear	37 (32% response rate) responded re CLU; 22 engaged with both models.	Not measured	Each model enhanced professional development and practice competence. CLU model: valued working with many nurses and health care providers; learning from different ways of practicing; being a team member; developing a distinct and personal way of practicing nursing. Preceptorship model: valued working with one nurse; modelled the reality of nursing; based on trust and consistent feedback; facilitated participants to consolidate practice skills.
Cantrell, MA., Browne, A.M. and Lupinacci, P. 2005, USA	Descriptive comparative study. Case control study - matched pairs	Summer nurse externship program	10 weeks	131 in total	2 groups of 26 (control and intervention) = 52	Not measured	No statistical difference between the groups on job satisfaction or sense of belonging. Statistically different mean scores between groups for professionalism and role socialisation - higher for control group. Did not support the hypothesis that participating in the externship made a positive difference to the variables measured.

Cantrell, MA., Browne, A.M. 2005, USA	Qualitative study	Summer nurse externship program	10 weeks	131 in total	6	Not measured	Nurse externs gained a more thorough perspective of the healthcare environment. Nurse externs became aware that the transition into the professional role required active and full participation in providing care. Externs felt part of the healthcare environment. The externship provided a clear, realistic understanding of the complex nature of providing care in the professional role, which created anxiety about transition.
Cheli, S., De Bartolo, P., Agostini, A. 2020 Italy	Pilot non- randomised controlled trial	Mindfulness- based education programme (MBEP) for students	6 weeks - 5 x 3 hour sessions and 1 x 4.5 hour session	82	82 (7 drop outs)	Not reported	Significant increase of dispositional mindfulness and a significant decrease of perceived burnout. The research shows promising results for the application of an MBEP that is coherently integrated into the nursing curriculum.
Christensen, F. 2005, Canada	Descriptive case study	Introduction to perioperative nursing programme and preceptorship programme (available to senior students and registered nurses)	12 weeks full time.	Not clear - maximum of 30.	Not clear	Program has increased retention in OR work – both students in cohort 2 worked in OR after qualification.	Students in cohort 1 had not been required to commit themselves to the OR after the completion of the course. The program involved a large investment by the hospital with a fifty percent retention rate after one year.
Christiansen, A. and Bell, A. 2009, UK	Interpretive Qualitative study	Peer learning partnership between first-	Not clear	Not clear - 3 cohorts of students	54	Not measured	The reciprocity inherent in peer learning was perceived as mutually beneficial.

		and third-year student nurses					Peer learning partnerships brought both affective and cognitive gains in terms of increased self-esteem, the development of nurturing relationships essential to successful mentorship, and a heightened sense of readiness for registration and future professional practice.
Chung, L.Y.F., Wong, F.K.Y. and Cheung, S.C.M. 2008, Hong Kong	Mixed methods	Pre-graduation clinical placement (PGCP)	1 month	Not clear	Not clear	Not measured	The PGCP fostered maturity for role transition. Students' competencies were improved, as rated by preceptors: 93% significantly improved and 7% insignificantly improved, as rated by students: 51% significantly improved and 49% insignificantly improve. Graduating students should be provided with the opportunity to undertake a continuous period of attachment for a supportive, reality-based, insider practice to ease the transition to the role of RN.
Difenbeck, C., Plowfield, L. and Herrman, J. 2006, USA	Descriptive evaluation	Clinical immersion senior year - Nurse Residency model.	Placements in each of 6 clinical areas for 3 days a week for 4 weeks, and preceptorship 'capstone' in an area of their choice.	Not clear	Not clear	Programme retention rates are tracked but data not provided.	Benefits included: improved transition to practice; Increased student accountability; enhanced socialisation; decreased clinical and classroom teaching needs (faculty staff reduction from 24.9-19.5fte).
Epstein, C.D. 2007, USA	Qualitative descriptive report	Capstone teaching project and preceptorship in final	One semester	58	58	Not stated or measured	100% of the 58 seniors described the capstone teaching project as a positive and interesting experience.

		semester of UG programme.					
Farooq S, Parpio Y, Ali F. 2015, Pakistan	Descriptive cross-sectional study	Implementation of a preceptorship model of supervision in final year	6 weeks (270 hours)	33	22	Not measured	18 (82%) participants considered it as good and very good; 9 (40.9%) of the participants were very satisfied with their preceptor; 11(51%) reported as satisfactory to fairly satisfactory; 2 (9%) were dissatisfied. Recognized as crucial approach to bridge theory and clinical practice, meet expectations as nurse professionals by role modelling & continuous support.
Frotjold, A., Hardy, J. and Butler, M. 2007, Australia	Quantitative descriptive study	4–6-hour snapshot visits to either the operating suite or high dependency area during the final nursing theory unit, plus additional academic preparation.	14 hours over 7 weeks.	OT - 168 HD - proportionate to OT. In 2007 123 students enrolled	Not clear	Not clear	Cohort size increased: For OT: 2005 - 25 students; 2006 - 48 students; 2007 - 95 students. For HD: proportionate increase to the OT. 89% felt it helped connect theory to practice; 88% that it contributed to considering working in the area on graduation; 88% greater understanding of the role; 83% that the snapshot enhanced the elective.
Gregory, S., Bolling, D. and Langston, N. 2014, USA	Qualitative descriptive evaluation	Externship for nursing students in perioperative area. Included clinical practicum and preceptor.	180 hours of clinical practicum	Between 2007 and 2011 120 students undertook the externship.	Not clear	Yearly attrition of new nurses in perioperative settings was 45%	Students felt it was an excellent experience to prepare them as a nurse, high levels of satisfaction with the programme. Increased interest in perioperative nursing as a career. Resulted in decreased use of agency nurses at the clinical site where the externships took place and increased numbers of younger nurses working in the perioperative areas where they externed.

Jiang R-S., Chou, C-C. and Tsai, P-L. 2012, Taiwan	Phenomenological study	Preceptor-guided clinical practicum	4 weeks	200 in the class	13	Not measured	Four themes emerged from the data: (1) information and new experience overload, (2) feelings of loneliness and stress, (3) questioning whether strict preceptors achieve the best results, and (4) beginning to feel like a nurse.
Kim, K. 2007, USA	descriptive correlational design	Preceptorship programme in final course of the pre-registration programme	160 hours of clinical experience	117	102	Not measured	Nursing competence skills among senior nursing students were positively related to participation in a clinical preceptorship program. The greater the amount of interaction with preceptors, the greater students' perception of their nursing competence skills became. Senior nursing students who felt that it was important to set goals and objectives with their preceptor perceived significantly greater nursing competence skills related to organizing, collaborating, delegating, and initiating nursing care. Students who felt that it was important to develop a trusting relationship with their preceptor perceived significantly higher nursing skills related to effective communication, collaboration with others, and attainment of new knowledge.
King M.L., Singh, M. and Harris, L. 2009, Canada	quasi-experimental design	Critical Care Bridging Programme (CCBP)	Specialty education (180 hours); supervised practice elements (300 hours)	Not clear	20 student-preceptor dyads	Not clear	Student and preceptor mean self-efficacy scores showed improvement following the CCBP. Preceptors reported significant improvement in students' confidence in all subscales except self-development.

Nash, R., Lemcke, P. and Sacre, S. 2009, Australia	Mixed methods	Enhanced model of final year nursing student placements to support effective transition experiences.	Not clear, possibly 8 weeks.	404	29 trial participants, 63 non-trial participants, total 92. Focus groups with 15 final year transition group students. Also 4 x FG with industry representatives.	Not measured.	No significant difference between the four groups regarding preparedness for practice. Themes from student focus groups: Growing in confidence and competence; becoming part of the team; experiencing real world nursing practice. Stakeholder FGs: Stepping back; feeling it's worthwhile; support for RN staff. The results of the trial indicated the importance of a positive and supportive clinical learning environment.
Pullon, S., Wilson, C., Gallagher., Skinner., McInlay, M., Gray, L. and McHugh, P. 2016, New Zealand	Pre and post quasi experimental Cohort study	A five-week, rurally located, clinically-based interprofessional programme as a transition-to-practice rotation for final-year, pre-registration health professional students	5 weeks	131	55 (42%) intervention group and 56 control group	Not measured	Rurally based IPE at the entry-to-practice phase of training can meet multiple objectives in preparing participating students for practice, over and above otherwise equivalent education for their non-participating peers. Challenging to set up in small communities with small health workforces, but delivery became easier over time, enhancing student learning and satisfaction. Students reported being significantly better prepared than a cohort of 56 non-participating colleagues in many aspects of their understanding of and knowledge about each of four key learning domains.

							Student satisfaction further increased across all domains in the second year.
Stacey, G., Aubeeluck, A., Cook, G. and Dutta, S. 2017, UK.	Case study methodology - qualitative evaluation.	Resilience-based clinical supervision	1 x 2 hour session every two weeks during clinical placement in the final six months of UG programme.	120	26	Not measured	Participants expressed positive experiences of resilience-based clinical supervision. Increased perception of the importance of self-care; commitment to caring for others was maintained. Students continued to demonstrate competencies of self-care six months after qualifying as nurses, despite the complexities of the workplace. Resilience-based clinical supervision has the potential to help healthcare practitioners to recognise and attend to workplace stressors through appropriate and effective alleviation strategies.
Starr, K. and Conley, V. 2006, USA	Qualitative methodology	Externship programme	3 x 12 hour shifts per week over a summer period of 16 weeks	16	10	Not measured	Growth within the nurse extern role is attributed to gaining basic and critical thinking skills, gaining confidence, and moving toward future goals. A major benefit was recognition as a team member, this increased students' confidence and decreased their stress.
Steen, J., Gould, W., Raingruber, B. and Hill, J. 2011, USA	Cross-sectional survey design. Quantitative	Internship programme	Unclear	60 potential subjects over 4 years of running the programme.	50	Not measured	Interns believed the programme increased their confidence in performing nursing tasks and in interacting with patients and families and created opportunities for career advancement. Internship programmes for nurses can significantly contribute to the success of new graduate nurses and consequently the quality of staff development.
Usher, K., Mills, J., West., C.,	Two-phase survey study	Capstone project	Not clear	54 intervention	Not clear	Not measured	Preregistration student nurses' perceptions of preparedness for practice did not increase

Park, T. and Woods, C. 2015, Australia				group, 113 control group			significantly following the introduction of the capstone subject.
Wieland, D.M., Atmiller, G.M., Dorr, M.T. and Robinson Wolf, Z. 2007, USA	Triangulated descriptive study	Pregraduation preceptored clinical experience	3 times per week for 3 weeks	32	32	Many students became integral members of hospital unit teams	Students' knowledge and skills increased during the preceptorship.

2.1.3 Discussion

This systematic review and narrative review were conducted to identify the types of interventions that have been implemented to target final year student nurses, with the goal of reducing their likelihood of leaving during their early careers as qualified nurses. In addition, the review aimed to summarise evidence of the success of these interventions. The systematic review identified six studies that provided post-qualification data to evidence the effectiveness of the interventions in increasing retention. Variation in intervention type, outcome, and components, coupled with missing data, made comparisons and conclusions difficult. Examination of a wider body of literature encompassing interventions aimed at easing transition from student nurse to qualified practitioner offered a more comprehensive view of the types of interventions aimed at student nurses. Inclusion of a narrative review of these studies was based on the premise that the transition period is influential on newly qualified nurses' decisions to stay or leave their current role or the profession due to reality shock (Kramer, 1974), or transition shock (Duchscher, 2009).

Most of the interventions focused on exposing student nurses to the reality of the nursing role, with the intention of offering them the opportunity to gain competence and confidence with nursing skills and expertise. Externships, internships, clinical immersion programmes, capstone projects, and preceptorships, all focus on student nurses spending time in the clinical environment, building relationships with qualified staff, observing role modelling of the accountable practitioners, and practising and developing skills in a supervised learning environment. This offers potential for the students to experience early socialisation into the nursing role. The findings from the review indicate that this exposure to the clinical environment does, overall, support students to feel more prepared for qualified practice, however, there were notable exceptions. Seven of the studies reported negative findings. One clinical immersion programme (Jiang, et al., 2012) and one externship (Cantrell and Browne, 2005) were found to increase students' anxiety, and decrease confidence. Although the experiences provided meaningful opportunities to increase their knowledge base and skill level, students experienced reality shock (Kramer 1974) much earlier by participating in the externship or clinical immersion. This led to

feelings of inadequacy and raised students' anxiety about the transition they were about to undertake to qualified practice (Cantrell and Browne, 2005). If newly graduated nurses are to enter the workplace as advanced beginners (Graf, et al., 2020a), it may be that recent advances in clinical simulation will allow students to gain confidence and competence in a safe environment with some exposure to the reality of a clinical environment, thereby reducing the impact of transition shock (Huston, et al., 2018; Rogers, et al., 2014).

The role of the preceptor, mentor, or supervisor becomes crucial to guide the student through this period of anxiety. Certainly, most of the studies reporting positive effects on transition to practice included elements of preceptorship, mentorship, or faculty supervision. In the studies where anxiety increased, it may be that cultural expectations in the clinical environment had the potential to thwart student curiosity or eagerness to learn (Jiang, et al., 2012). In the UK, the preceptorship model is implemented widely for newly qualified nurses rather than students but is often challenged by lack of suitable preceptors due to workload pressures or staffing deficits (Whitehead, et al., 2013; Irwin, et al., 2018). Preceptorships implemented with early career nurses are seen to have positive effects on nursing competence (Ke, et al., 2017), and confidence (Irwin, et al., 2018), which suggests that preceptor or mentor support in undergraduate interventions may also be a useful component. Reviews of mentorship models (Nowell, et al., 2017; Zhang, et al., 2016) conclude that while mentorship can have a positive effect, mode of delivery and individual characteristics of clinical educators may impact on effectiveness. More research is required to establish which support models would be most helpful to students undertaking these interventions.

Whereas most studies reported positive impacts, which aligns with the findings of a review of strategies implemented following graduation (Edwards, et al., 2015), other interventions were found to have no effect or a detrimental effect on perceptions of preparedness for practice, confidence, knowledge, or job satisfaction, in comparison to control groups or pre-intervention data (Nash, et al., 2009; Usher, et al., 2015; Friday, et al., 2015). This suggests that careful consideration should be given to both the intervention model and the implementation context, especially the learning environment, during the undergraduate educational programme. The influence of the practice environment on decisions to stay or

leave is well documented (Twigg and McCullough, 2014) and it may be that this influence becomes stronger at different periods of transition (Kenny, et al., 2021; Meyer, et al., 2017). During the undergraduate programme students may have been predominantly supernumerary in clinical settings and this may have led to strong expectations of their student role. Interventions that require students to take a more active role in clinical care should incorporate strategies to enable students to learn in a supportive and inclusive team that fosters a sense of belonging (Nash, et al., 2009). A sense of belonging for students in a clinical area has been strongly linked to workplace satisfaction, and workplace satisfaction is a key determinant of career decisions (Borrott, et al., 2016). Staff-student relationships are central to cultivating a sense of belonging (Levett-Jones, et al., 2009), which is considered a prerequisite to active participation and learning (Nolan, 1998; Levett-Jones and Lathlean, 2008), and may support students to maximise the benefits of mentor or preceptor relationship.

One mechanism for developing and enhancing a positive learning environment is to establish strong links and collaboration between the clinical area and the academic provider. This is a strategy endorsed by policy makers in the USA, and UK (Altman, et al., 2016; Spector, 2015; Health Education England, 2018; NMC, 2018). Many of the papers advocate partnership development and delivery of the interventions, and collaborative implementation seems to be associated with positive impacts on students' readiness for qualified practice, and linking theory and practice (Broad, et al., 2011; Frotjold, et al., 2007; Gregory, et al., 2014; Stacey, et al., 2017; Steen, et al., 2011; Wieland, et al., 2007). Wieland, et al., (2007) suggest that further modification of their preceptorship would include enhanced communication between academic and clinical preceptors, reiterating the importance of this element. Only one study (Jiang, et al., 2012) reported negative findings from a collaborative intervention. The authors provide detail about the context of healthcare learning in Taiwan and suggest that cultural traditions impacted on the learning environment and nature of collaboration.

Callaghan, et al., (2008) report a collaborative intervention that offered students autonomy to identify and work towards their own learning needs. Academic partners, clinical staff and students worked together within a collaborative learning unit to maximise educational

development. Whilst similar collaborative models have been criticised due to difficulty obtaining feedback about student progress (Budgen and Gamroth, 2008), the findings from this study suggest that the close collaboration between academic and clinical staff, and the responsibility given to students to manage their learning, gave them heightened awareness of teamworking and professional development, equipping them better for transition into practice. This is also a rare example of an intervention where the student voice is foremost in the delivery.

All but three of the studies were implemented outside of the UK, where the undergraduate nursing programmes vary regarding ratios of theory to practice. In the USA, students undertake around 700 hours of clinical practice to consolidate their theoretical learning and in Australia, students complete upwards of 800 hours of clinical exposure over the duration of their BSc programme. In the UK, student nurses are required to complete 2,300 hours of supervised clinical practice, which is significantly more than in most other countries. This suggests that socialisation into nursing starts much earlier in UK students' undergraduate programmes, which is an important consideration for this research study. Lack of studies from the UK implementing interventions that increase clinical exposure may be because this is not such a pressing requirement for UK nursing students, and reiterates the value of considering the whole curriculum, rather than the final year, to prepare students more adequately for practice as qualified practitioners (Meyer, et al., 2017). Of interest in the UK, therefore, may be the psychological wellbeing interventions that were implemented during the final year of the pre-registration programmes but aimed to support the students to cope better with the reality of accountability in the role of newly qualified nurses. Two of the studies implemented such interventions (Cheli, et al., 2020; Stacey et al., 2017), both with positive and enduring outcomes in relation to perceptions of burnout and resilience-based competencies. Although retention data were not quoted in these papers, burnout has strong links with job dissatisfaction, job performance and turnover (Aiken, et al., 2012; Zangaro and Soeken, 2007). Interventions that support newly qualified nurses to cope effectively with the inevitable challenges of novice practice in a clinical environment potentially compromised by suboptimal staffing resource and high patient acuity have significant promise in the UK setting. The physical and emotional labour of the nursing role, coupled with stress and high workloads, suggests that resilience-building strategies, which

are already incorporated to a greater extent in social work education programmes, would be of benefit to student nurses to prepare them for transition, and to support them to maximise the potential of available support and supervision (Collard, et al., 2020). A review of intervention strategies to decrease anxiety and stress in student nurses (Turner and McCarthy, 2017), concluded that further research is needed in this area to determine the most appropriate approaches, although studies describing cognitive reappraisal had consistently positive outcomes.

The findings indicate that consideration should also be given to whether there is added value to implementing interventions during the undergraduate period if there are established and well-evaluated strategies already in place in the first few months following graduation. Finite resources in healthcare organisations necessitate careful allocation of funds and there is mixed evidence from this review that the inclusion of a pre-registration programme in addition to an established post-graduation programme offers long term positive effects on retention (Friday, et al., 2015). Conversely, there may be short term financial gains resulting from streamlined recruitment processes resulting from direct transition from undergraduate to postgraduate interventions (Courtney, 2005).

2.1.4 Recommendations

Concerns about the quality of reporting and the absence of retention data limit recommendations about potentially successful interventions. For those studies that reported retention data in the systematic review, the outcomes were mixed. For the wider body of literature examined, outcomes related to retention were scarce, but the additional findings suggest interventions that incorporate preceptors, expose students to the reality of the clinical environment, and involve collaboration between the academic and clinical institutions, in the main report positive outcomes related to transition to qualified practice. Most of the papers originated in America, Canada, or Australia, so for implementation in the UK, consideration should be given to the level of exposure students currently have to clinical practice, and the benefits that interventions with alternative approaches such as psychological wellbeing programmes may bring.

Future research should focus on identifying and evaluating the components of interventions implemented during the final year of undergraduate programmes that would have the greatest effect on retention, particularly using high quality methodology. Carrying out this research with a focus on quality methodology will allow for conclusions to be drawn about the effectiveness of an intervention, and comparisons to be made across studies.

Consideration should also be given to the economic benefits of implementing interventions prior to qualification, especially when there are established interventions available to newly qualified nurses. More research is required to determine the effects of these interventions on retention, including economic evaluation to help inform policy and practice in the context of limited fiscal resources.

2.1.5 Limitations, Including Methodological Quality

When reflecting on the implications of the results, limitations of the study should be considered. The systematic review was conducted using processes aligned to the PRISMA guidelines (Moher, et al., 2009), however, the narrative synthesis for the wider literature was not conducted in strict adherence and therefore the potential for bias should be recognised. This was mitigated by the doctoral student and supervisor collaborating to resolve questions and dilemmas about search terms, inclusion criteria, and quality appraisal.

The review searches identified a small number of studies that met the inclusion criteria, and these six studies include inconsistent and incomplete description of the interventions, missing detail of some components of the intervention, variations in sample size and the method of evaluation. The conclusions that could be made were therefore necessarily limited by the quality of the study reports that were available. The quality appraisal identified areas of weakness, such as the studies not being conducted using rigorous research methods, but all studies that met the eligibility criteria were included to provide a complete description of the body of work. The wider literature was not critically appraised due to the diversity of the content and presentation, therefore quality cannot be assured.

2.1.6 Conclusion

A large body of literature has been reviewed and greater understanding of the types of interventions that target student nurses with the goal of reducing likelihood of leaving once

working as early career nurses has been achieved. There is some evidence of these interventions leading to increases in retention, but this is limited both by the quality of the reporting and the scarcity of data. Additional benefits to the experience of transition from student to early career nurse have been noted, and interventions with successful outcomes incorporate preceptorship, exposure to the reality of clinical practice as a nurse, psychological wellbeing mechanisms, and collaboration between academic and healthcare organisations. There is little evidence of student involvement in the design or implementation of the interventions. Future research should focus on standardising the reporting of interventions and carrying out the research with rigorous methodology. Economic evaluation of the benefits of implementing interventions in the undergraduate period should also be conducted. Clinical practice and academic settings should consider the current clinical exposure of students during their undergraduate programmes and review proposed or actual interventions to maximise added value.

2.2 Additional review of psychological wellbeing programmes

Due to the unique nature of UK pre-registration education programmes for nurses, incorporating 2,300 hours of clinical exposure over the three-year course, programmes that offer mechanisms for psychological wellbeing appear to hold merit as an alternative approach to ease the transition from student to qualified practitioner. It is less clear whether these interventions also impact on retention of early career nurses. To gain more insight into the potential of such programmes for implementation in this PhD study an additional scoping review was conducted. The findings of the review, with particular focus on a psychological skills training programmes are reported in the following sections.

2.2.1 Psychological wellbeing programmes for students or early career nurses

Stress and anxiety are recognised as common features of the final year of undergraduate nursing programmes and the first few months as a qualified nurse (Phillips, et al., 2017; Brandt, et al., 2017; Turner and McCarthy, 2017; Labrague, et al., 2018; Suresh, et al., 2012). For students, this stress is partly due to the requirement to study in both academic and clinical settings concurrently (Crary, 2013), and may be exacerbated by demands outside of their student role such as caring responsibilities, a part-time job, or financial challenges

(Wray, et al., 2012; Wray, et al., 2017). After qualification, stress resulting in intention to leave the job or profession, has been identified to be highest during the first 1-2 months (Yeh and Yu, 2009; Lin, 2020). Challenges with transition are acknowledged to be dependent on individual factors such as prior experience, resilience, and expectation, or linked to the new graduate's response to the work they are asked to carry out, which may involve ethically challenging situations leading to moral distress (Bong, 2019; Krautscheid, et al., 2017).

A recent systematic review of interventions to support graduate nurse transition to practice (Kenny, et al., 2021) found that the content of only a small number of the programmes reviewed extended to supporting psychological or emotional wellbeing. One study (Kulka et al., 2018) described a mindfulness-based stress reduction programme for newly qualified nurses, reporting an outcome of reduced stress for the new nurses. The narrative synthesis conducted and reported in the previous section of this chapter identified only two studies incorporating a mindfulness-based intervention (Cheli, et al., 2020) and a resilience-based intervention (Stacey, et al., 2017) implemented with final year students to support their transition and retention post qualification. However, it may be that the scope of literature reviewed was limited by the searches, as only those interventions that reported transition or retention outcomes were considered.

Although not aimed directly at retention of students or early career nurses, Galbraith and Brown (2011) conducted a literature review of interventions implemented to reduce stress for student nurses during their education programme. Most interventions reviewed aimed to modify the individual student's response to stress, rather than removing or reducing the stressors, and the authors speculated that this may have been because there was poor understanding at the time of what those organisational stressors may be. Although outcomes for the reviewed studies were mixed, they concluded that the most effective interventions were those that provided skills for dealing with stressful situations, such as mindfulness and relaxation, combined with skills for cognitive reappraisal, and ways for students to reduce the intensity and number of stressors. These conclusions came with the caveat that further research was recommended, specifically into the long-term effects of stress interventions. Cognitive reappraisal was the technique most underpinned by theory,

particularly Lazarus and Folkman's (1984) transactional model of stress and coping, which assumes that cognitive reappraisal increases the individual's perceived ability to cope. Theory based interventions were more effective and therefore recommended for future implementation (Galbraith and Brown, 2011). One particular theory based intervention, Acceptance and Commitment Training (ACT), was the subject of a randomised controlled trial with student nurses. Findings indicated that the intervention resulted in increased mindfulness, decreased experiential avoidance, and decreased perceived stress and burnout (Frogeli, et al., 2016), suggesting that ACT may benefit from further scrutiny as an intervention to increase retention of early career nurses.

Turner and McCarthy (2017) conducted a subsequent literature review of 26 intervention strategies designed to decrease stress and anxiety in nursing students. The review found that reducing stressors through curriculum redevelopment held merit, as did cognitive reappraisal, either independently or in combination with other approaches, but again concluded more research was required. It was notable that several papers had been published between 2010 and 2015 focusing on reducing the number of stressors students are exposed to, such as incorporating simulation techniques in the curriculum, allocating student clinical placements in familiar areas, and peer assisted learning relationships. This indicates a recognition of the need to shift thinking beyond the individual to find a solution. Wider literature indicates that stress management is more effective when the intervention focuses on either the interface between the individual and their organisation, or the individual and the organisation (Galbraith and Brown, 2011). Interventions that incorporated cognitive reappraisal in combination with other approaches included programmes to develop self-reflection skills (Manning, et al., 2009; Rees, 2013), or reflection combined with mindfulness (Schwarze, 2012), all reporting positive effects on stress.

In the period since the most recent systematic review, several additional relevant papers have been published. These report implementation of interventions aimed at psychological wellbeing of students or early career nurses, or explored the phenomena of stress, resilience, and coping in that group. Resilience is seen as important to enable students or early career nurses to cope with stress during the transition period. Dispositional

mindfulness, where mindfulness has become embedded as a trait, or the innate ability for students to remain psychologically flexible and accept their responses to the situation in which they found themselves (Waugh, et al., 2011), is a key predictor of resilience (Chamberlain, et al., 2016). Levels of dispositional mindfulness may also influence student nurses' working memory capacity and ability to regulate emotions (Dubert, et al., 2016). This is a compelling rationale for incorporating mindfulness into nurse education or post-qualification interventions, although a recent study indicated that in the USA, psychological wellbeing resources are still essentially absent from undergraduate nursing curricula (Cochran, 2020), and recommended that curricula be modified to include preventative strategies such as developing positive coping skills. Reports of the outcomes of programmes that have embedded mindfulness into undergraduate curricula demonstrate positive outcomes, with increases in dispositional mindfulness (Cheli, et al., 2020), decreases in negative emotions, stress, and anxiety (Chen, et al., 2021), and positive evaluations of feasibility (Delaney, et al., 2016). One study highlighted the relationship between the motivation of the participants to undertake a mindfulness course, and the subsequent outcomes (Niessen and Jacobs, 2015), opening the debate about the compulsory or voluntary nature of mindfulness programmes in the curricula. The NURSE intervention (Nurture nurse, Use resources, foster Resilience, Stress and Environment management) (Delaney, et al., 2016), incorporated three areas of effective stress management: relaxation and mindfulness meditation, cognitive reappraisal, and decreasing environmental stressors, therefore increasing resilience. Using combined strategies to decrease stress and support the psychological wellbeing of students holds promise as a way of maximising the positive outcomes (Cheli, et al., 2020; Turner and McCarthy, 2017; Galbraith and Brown, 2011) and can address facets of both the individual and the organisational factors that cause stress for student nurses. One such well-established and well-evaluated programme is Acceptance and Commitment Training (ACT). Although developed in the USA, the programme was championed and widely implemented and tested in the UK by psychologists from City, University of London (Flaxman and Bond, 2010; Wardley, et al., 2014; Waters, et al., 2018). ACT is explored in more detail in the following section, particularly in relation to the appropriateness of the programme for use with early career or student nurses.

2.2.2 Acceptance and Commitment Training

ACT is an evidence-based cognitive behavioural skills programme that helps people relate differently to difficult thoughts and emotions so that they can construct their life around what really matters to them (Harris, 2006). ACT has been used extensively to support individuals to cope more effectively with challenging health conditions (Hayes, et al., 2012), and has been demonstrated to encourage and support positive lifestyle and behavioural changes (Yildiz, 2020). ACT is also used as an individually focused occupational stress management intervention that is implemented to enhance employees' coping mechanisms, for example when faced with stressful situations or dealing with challenging and unwanted emotional responses such as worry (Lloyd, et al., 2017). The programme uses strategies to encourage participants to identify and internalise their own values and recognise and demonstrate behaviours that are consistent with these values in a commitment to values-based living (Hayes, et al., 2011). Concurrently, ACT draws on mindfulness techniques to support stress relief and a focus on the here and now. Rather than trying to change thought processes, ACT encourages behavioural regulation, psychological flexibility, and acceptance of difficult situations without conflict (Zhang, et al., 2018).

Psychological flexibility is considered especially important for psychological health and allows individuals to balance their ambitions and their needs when faced with incoherent situations or distress (Kashdan and Rottenberg, 2010; Kashdan, et al., 2020). ACT has been demonstrated to reduce psychological distress (Waters, et al., 2018) and to have a moderate effect on anxiety and depression (Heydari, et al., 2018; Hacker, et al., 2016) when used in occupational settings. In addition, studies of ACT have reiterated the manipulable nature of psychological flexibility, which in turn mitigates emotional burnout (Lloyd, et al., 2013), a significant contributor to nursing attrition.

ACT may be particularly appropriate as an integral part of an intervention to increase retention of early career nurses because of the context-driven approach (Zhang, et al., 2018). Psychological flexibility is contextual because it aims to alter an individual's relationship with an event rather than the event itself (Kashdan and Rottenberg, 2010). The focus of ACT intervention sessions for students or early career nurses would be on how they

interact with negative thoughts and feelings encountered in the clinical environment, and how they could, in the face of these difficult emotions and thoughts, continue to demonstrate behaviour that was in keeping with their own personal values. In essence, ACT encourages participants to develop skills that help them to 'be the nurses they want to be', going some way to bridging the gap between their expectations of the qualified nurse role and the reality of the clinical environment. The randomised controlled pilot trial of ACT with student nurses (Frogeli, et al., 2016) demonstrated positive effects including increased mindfulness, decreased experiential avoidance, and decreased perceived stress and burnout. Although more trials are needed with student nurses, the evidence from the literature about the benefits of supporting the psychological wellbeing of students and early career nurses, together with the evidence of effectiveness of ACT in occupational settings, support the hypothesis that ACT could be beneficial during the transition from student to qualified practitioner.

2.3 Publication 1: Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: a systematic review

The second literature review in this chapter considers interventions implemented in the first year after new nurses qualify and enter their professional roles. A range of different interventions have previously been proposed, implemented, and evaluated to increase retention of early career nurses. While there was a body of knowledge about the effectiveness of these interventions, a systematic understanding of which components of those interventions contribute to their success was lacking. Examining these interventions and their components was important to inform the development of a novel intervention in the current study. Consequently, a systematic literature review was conducted as a preliminary stage of the PhD study.

The aim of the systematic review was to explore the characteristics of successful interventions to reduce turnover and increase retention of early career nurses. In the initial review, a total of 3,252 papers were scrutinised at the level of title and abstract, and 53 were included in the review. These 53 papers, which covered a wide variety of interventions and components within those interventions, were appraised and narratively summarised. This was the first systematic review to consider which components of

interventions contribute to their success. The papers described a wide range of interventions, and some interventions were explored and reported by multiple studies in different contexts, strengthening the credibility of the conclusions that could be drawn.

The review was published in the International Journal of Nursing Studies. This journal ranks number 1 out of 114 nursing journals in Web of Science and had an impact factor of 3.783 in 2020. Editorial comments following peer review indicated there was appreciation for the topic and for the work, reinforced by the fact that at the point of submission, the paper had already been cited by other authors (107 times Google Scholar; 57 times ResearchGate). The paper has been included as the literature review chapter of this document.

2.3.1 Declaration of contribution to the systematic review process

The conduct of the systematic review and writing for publication was, in accordance with the methodology, led by me as doctoral student with support from supervisors and a research assistant to ensure that all phases of the review process were undertaken to the highest standards. The team approach strengthens the outputs by minimising the risk of error and bias in the process (Aromataris and Pearson, 2014). The PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) (Moher, et al., 2009) were used to structure the systematic review process and the reporting of the findings. PRISMA requires that rigorous methods are applied to study selection, critical appraisal, and data extraction, in particular that these steps are conducted by independent reviewers and in duplicate. This helps to minimise subjective interpretation and enhance confidence that the results of the review are free from inaccuracies.

In the context of a team approach, the following table indicates which activities were conducted by which team members, with specific emphasis on my role (JB) as doctoral student.

Table 6 Contribution of team members to systematic review processes

Systematic Review Activity	Individuals involved	Comments
Development of Review Question and Inclusion Criteria	Judy Brook (JB) Professor Leanne Aitken (LA) Professor Debra Salmon (DS) Dr Julie MacLaren (JM)	The review question was developed as a collaboration between PhD student and supervisors. JB conducted scoping searches to identify the extant literature and in particular systematic reviews on the subject.
Study selection and critical appraisal	Judy Brook (JB) Professor Leanne Aitken (LA) Professor Debra Salmon (DS) Dr Julie MacLaren (JM) Dr Rebecca Webb (RW)	JB conducted the searches. JB reviewed all papers and LA, DS and JM reviewed 33% of the papers each against the inclusion criteria. JB and RW conducted critical appraisal against the Joanna Briggs Institute Critical Appraisal tools for Quasi Experimental and Randomised Controlled Trials.
Data extraction and synthesis	Judy Brook (JB) Professor Leanne Aitken (LA) Professor Debra Salmon (DS) Dr Julie MacLaren (JM) Dr Rebecca Webb (RW)	JB and RW conducted data extraction and synthesis, with guidance from LA and DS.
Interpretation of findings and recommendation to guide nursing practice	Judy Brook (JB) Professor Leanne Aitken (LA) Professor Debra Salmon (DS) Dr Julie MacLaren (JM) Dr Rebecca Webb (RW)	JB interpreted the findings with guidance from DS, LA and JM.
Writing of systematic review paper for publication	Judy Brook (JB) Professor Leanne Aitken (LA) Professor Debra Salmon (DS) Dr Julie MacLaren (JM) Dr Rebecca Webb (RW)	JB wrote the drafts of the paper for publication and prepared the paper for submission to the journal. RW contributed to drafts of the paper. LA, DS and JM were involved in review of drafts, and advice about revisions.



STATEMENT OF CO-AUTHORS of JOINT PUBLICATIONS

TO WHOM IT MAY CONCERN

Title of publication: Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: a systematic review

Name of candidate: Judy Brook

Title of research thesis: Development and implementation of an intervention to increase retention and decrease burnout of early career nurses

Name of first supervisor: Professor Leanne Aitken

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

Signature:

Name: Judy Brook

Date: 10.08.2020

Signature:

Name: Professor Leanne Aitken

Date: 07.04.2021

Signature:

Name: Dr Rebecca Webb

Date: 29.04.21

Signature:

Name: Dr Julie MacLaren

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Date: 21st April, 2021

Statement indicating the candidate's contribution to the publication

This statement is written in accordance with the Contributor Roles Taxonomy (CRediT) as this is now commonly required during the submission process and published with the paper.

Judy Brook: Conceptualisation, methodology, validation, analysis, investigation, writing – original draft, writing – review and editing, visualisation, project administration, funding acquisition.

Leanne Aitken: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Rebecca Webb: Analysis, investigation, data curation, writing – original draft.

Julie MacLaren: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Debra Salmon: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

2.3.3 Published paper

Conflict of Interest: none

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Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: A systematic review

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ABSTRACT

Background: Nurse shortages have been identified as central to workforce issues in healthcare systems globally and although interventions to increase the nursing workforce have been implemented, nurses leaving their roles, particularly in the first year after qualification, present a significant barrier to building the nurse workforce.

Objective: To evaluate the characteristics of successful interventions to promote retention and reduce turnover of early career nurses.

Design: This is a systematic review

Data sources: Online databases including Academic Search Complete, Medline, Health Policy reference Centre, EMBASE, Psychinfo, CINAHL and the Cochrane Library were searched to identify relevant publications in English published between 2001 and April 2018. Studies included evaluated an intervention to increase retention or reduce turnover and used turnover or retention figures as a measure.

Review methods: The review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Studies were quality-assessed using the Joanna Briggs Institute Critical Appraisal tools for Quasi Experimental and Randomised Controlled Trials. Retention/turnover data were used to guide the comparison between studies and appropriate measures of central tendency and dispersion were calculated and presented, based on the normality of the data.

Results: A total of 11,656 papers were identified, of which 53 were eligible studies. A wide variety of interventions and components within those interventions were identified to improve nurse retention. Promising interventions appear to be either internship/residency programmes or orientation/transition to practice programmes, lasting between 27–52 weeks, with a teaching and preceptor and mentor component.

Conclusions: Methodological issues impacted on the extent to which conclusions could be drawn, even though a large number of studies were identified. Future research should focus on standardising the reporting of interventions and outcome measures used to evaluate these interventions and carrying out further research with rigorous methodology. Clinical practice areas are recommended to assess their current interventions against the identified criteria to guide development of their effectiveness. Evaluations of cost-effectiveness are considered an important next step to maximise return on investment.

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What is already known about the topic?

- Nurse turnover and retention impact on healthcare workforce development and delivery of clinical care
- A critical time for turnover of nurses is during the first year after qualification
- Interventions to reduce turnover and increase retention have been implemented but there is little understanding of which characteristics of these interventions contribute to their success

What this paper adds

- Promising interventions appear to be either internship/residency programmes or orientation/transition to practice programmes, lasting between 27–52 weeks, with a teaching and preceptor and mentor component.
- These characteristics can be used as a foundation for developing or refining transition programmes for early career nurses so that maximum return on investment is achieved.

1. Introduction and background

The sustainability of the health workforce is a global imperative (World Health Organisation (WHO), 2017) and nurse shortages have been identified as central to workforce issues in healthcare systems in both high and low income countries (Van der Heed and Aiken, 2013; Li et al., 2010). Although campaigns to increase the nursing workforce have been implemented in several countries such as Australia, United Kingdom and China (Health Workforce Australia, 2014a; Department of Health, 2017; Ministry of Health, 2005), nurses leaving their roles, particularly in the first year after qualification (Zhang et al., 2016), present a significant barrier to building the nurse workforce. This paper aims to systematically review interventions to reduce attrition and promote retention of early career nurses, with particular exploration of the characteristics of effective interventions.

Turnover of nurses is a widely but inconsistently used measure for healthcare organisation analysis. It can encompass nurses who leave a particular post, an organisation or the profession entirely. Turnover may also be voluntary, or involuntary for example due to performance management. These inconsistencies result in variation in reporting of turnover rates (Kovner et al., 2014; Li and Jones, 2013). Turnover in any form draws on healthcare organisation funding as it is expensive to recruit new nurses into the global or organisational workforce. It is therefore valuable to consider how turnover can be reduced and retention of nurses increased, particularly voluntary turnover where nurses are lost to an organisation or the profession.

Although less is known about the adequacy of the nursing workforce in developing economies, surveys indicate that it is a global issue (WHO, 2010) and particularly acute in rural and remote areas where it has major consequences for accessibility to healthcare (Mbemba et al., 2013). In countries with developed healthcare systems, the extent and impact of nurse turnover has also been noted. Examples include the USA, where a survey of 136 organisations in 2017 indicated bedside registered nurse turnover averaged 14.9%, with an annual hospital financial loss of \$5.13M – \$7.86M and 80% of hospitals reporting a registered nurse vacancy rate greater than 5% (Nursing Solutions Inc, 2017). Health Workforce Australia (2014a) predicted a shortfall of approximately 85,000 nurses by 2025, and 123,000 nurses by 2030 due to demand significantly exceeding supply in the short to medium term. In the UK, the picture is similar, with a shortfall of 22,000 nurses in England in 2015 and a projected shortfall of 10–15% of the nursing workforce by 2020 (Buchan et al., 2017). Within the UK in Scotland specifically, the shortfall of nurses has resulted in greater spend on temporary nurses, impacting on budgets (Audit Scotland, 2017) and a similar picture is emerging in Wales and Northern Ireland (Royal College of Nursing, 2018). In Europe the workforce crisis was extensively explored by the European NEXT (Nurses Early Exit) –study (Hasselhorn et al., 2003). In addition, the Registered Nurse Forecasting (RN4CAST) project indicated that 20–50% of nurses intended to leave their jobs across a sample of eight countries including Belgium, France, Germany, Greece, Ireland, Poland, Spain and Switzerland. This has significant

impacts on the provision of safe patient care and patient mortality rates (Zander et al., 2016).

The nursing workforce has consequently become central to national and global health policy (WHO, 2017) and recommendations focus on leadership and productivity (Health Workforce Australia, 2014b), education (Zander et al., 2016) and retention (Department of Health, 2017; Good Governance Institute, 2015) to mitigate risk of the forecast nursing shortage. There has been particular scrutiny of the effectiveness of interventions to both reduce turnover of nurses between organisations and increase retention of nurses in the profession (Mbemba et al., 2013; The Association of UK University Hospitals, 2017). In England, this has led to a national nurse retention initiative to secure a sustainable NHS workforce for the future (NHS Improvement, 2017).

Although current nurse workforce issues are particularly acute, this is not a new concern and the nursing literature is replete with examples of initiatives to reduce turnover and increase retention in high and medium income economies. There has been a particular focus on those in the early stages of their careers (Whitehead et al., 2013; Rush et al., 2013; Al-Dossary et al., 2014) as the transition from student to registered nurse is seen as a critical time as turnover is high in the first year following qualification. Broadly speaking, these initiatives fall in to six categories (McDonald and Smith, 2012; Edwards et al., 2015): preceptorship, mentoring programmes, residency programmes and internships, externships, transition or orientation to practice programmes and clinical ladder programmes (Table 1).

In reality, there is substantial overlap between different types of interventions to support transition from student nurse to qualified practitioner and encourage retention of nurses; individual programmes may not fit neatly into one category. In addition, there is significant variation between the content and quality of the programmes within each category (Van Camp and Chappay, 2017; McDonald and Ward-Smith, 2012). Edwards et al. (2015) suggest that by offering a transition to practice programme of any description, the organisation is indicating the importance attached to newly qualified nurses and this alone is enough to positively influence recruitment and retention, especially if the organisation is perceived to be investing in the workforce to a greater extent than competitors.

There is a growing body of literature that explores the effectiveness of strategies to support such transitions (Al-Dossary et al., 2014; Edwards et al., 2015; Irwin et al., 2018; Ke et al., 2017). Effectiveness may manifest as an increase in job satisfaction, confidence, or competence, and alternatively a decrease in involuntary turnover. However, there is a significant knowledge gap in the literature about the characteristics that influence the successful outcomes of interventions. Healthcare organisations are implementing interventions in an attempt to reduce turnover and increase retention but the evidence base does not offer sufficient guidance about which elements of an intervention are the most influential in their success. Ten years ago, Salt et al. (2008) conducted a systematic review of healthcare organisation retention interventions, however this did not explore the components or characteristics of the interventions. This systematic review is therefore the first to identify the characteristics of successful interventions to reduce turnover and increase retention of early career nurses.

2. Method

Initial scoping searches were conducted, including Google Scholar and the Cochrane Library to identify similar and relevant systematic reviews that had already been conducted. Subsequent literature searches and study selection for this systematic review were conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (Moher et al., 2009; <http://prisma-statement.org/>).

Table 1
Interventions to increase retention of early career nurses.

Intervention	Description	Characteristics
Preceptorship (Irwin et al., 2018; Ke et al., 2017; Whitehead et al., 2013)	- Designed to support transition from student to qualified practitioner, originated in the USA - In the UK seen as a way of socializing the new nurse in to the profession	- Newly qualified nurse is allocated a qualified nurse preceptor and regular meetings are arranged - May involve formal teaching, supervision and competency assessment - Usually of defined length but can vary from a few weeks to up to two years in duration - Relationship between preceptor and preceptee is fundamental for psychological support, knowledge exchange and role modelling
Mentoring Programmes (Zhang et al., 2016)	- Draws on a mentoring relationship to support transition into the workplace - Relationship between mentor and mentee may be enduring and nurturing	- Vary widely in format and structure - May include dyad models, peer mentoring, group mentoring, constellation models or online distance mentoring - Mentors may be allocated to mentees or may rely on self-selection or incentives to motivate tenacity in the relationship
Residency Programmes and Internships (Al-Dossary et al., 2014; Anderson et al., 2009)	- Predominantly established in the USA, Canada and Australia in response to retention challenges in the 1980s - Aim to develop and consolidate clinical reasoning and leadership skills of new graduates	- Contractual arrangement between the new graduate nurse and the employer - Usually lasts between six months and one year - Delivered in partnership between academia and practice - Involve structured teaching linked to clinical immersion and a mentoring relationship
Externships (Friday et al., 2015)	Opportunities for student nurses to undertake experiential learning in a new clinical area on a short placement	- Usually lasts no longer than a semester - Opportunity for student to apply theoretical knowledge, experience the clinical environment and understand workplace opportunities - Valuable in nursing programmes that are weighted in favour of theory rather than practical placements
Orientation and Transition to Practice Programmes (Rush et al., 2013)	- Designed to support the socialisation of new nurses in to the workplace - May be generalised to promote transition in to the organisation or more specialised, to facilitate development of skills specific to a particular clinical area	- Involve formal teaching and a mentor or preceptor relationship - Often shorter in duration
Clinical ladder or Advancement Programmes (Drenkard and Swartwout, 2005)	- Organisational structures that allow nurses to gain promotion and recognition for their developing skill and achievement - Implemented as a means of enhancing the quality of nursing care and as a mechanism for enhancing nurse satisfaction	- Offer clarity about professional development and promotion - May involve competency assessment - Usually involve remuneration for achievement

2.1. Eligibility criteria

Studies were required to meet the following criteria to be eligible for inclusion in the systematic review: peer-reviewed journal articles published in the English language between 2001 and 2017. A 2001 parameter was applied to ensure currency of findings. Studies were included in the review if they reported primary research on interventions designed to reduce the attrition or increase retention of the nursing workforce, with data on attrition/retention/turnover rates reported, on at least two occasions (e.g. pre-post data, time series design, RCT, equivalent or non-equivalent control) for comparison.

2.2. Search strategy

Searches were conducted to identify peer reviewed publications using key search terms. Search terms were constructed in collaboration with an academic librarian and were based on a PICO structured question. Only P (population) and O (outcome) were used to construct the searches as C (comparison) was not relevant and I (intervention) proved too limiting. Three groups of search terms were used and then combined using the Boolean operators AND and OR including: (retain*, retention, attrition, leav*, turnover, quit, loyalty) AND (staff, personnel, employee, workforce) AND nurs*. All terms were used in each database. Limits were imposed around date of publication and publication language in accordance with the eligibility criteria. Detail of a full search is presented in Supplementary table S7.

2.3. Data sources

Online databases searched included Academic Search Complete, Medline, Health Policy reference Centre, EMBASE, Psycinfo, and CINAHL. The reference lists of relevant systematic reviews were used to identify further studies. Initial searches were conducted between January 2017 and March 2017 and repeat searches conducted in April 2018.

2.4. Study selection and data extraction

Duplicate papers were removed and studies were screened against the inclusion and exclusion criteria for eligibility, based on the abstract and title. This was undertaken by two researchers (JB and either IA, DS or JM). Where the two researchers were not in agreement, the paper was downloaded and read in full and a mutual decision made about eligibility. Full papers for all tentatively included studies were downloaded and scrutinised by one researcher using a screening tool to confirm that the studies met the inclusion criteria. Any ambiguous studies were discussed with a second researcher and assessed as either eligible or ineligible.

2.5. Quality appraisal

All included studies were quality appraised using the relevant Joanna Briggs Institute checklist for quasi-experimental studies, which asks 9 questions or the checklist for Randomised Control Trials, which asks 13 questions (Tufanaru et al., 2017). Each paper

was awarded a quality assessment score by adding the total number of positive responses.

Initially 6 (12%) of the papers were double coded by two researchers with a 75% agreement about eligibility. The criteria were subsequently refined and a further 6 (12%) were double coded with at least 95% agreement. The remaining papers were assessed by both researchers and any clarity issues were resolved in discussion with the research team. This process aligns with guidance offered by the Cochrane Library (Higgins and Green, 2011).

2.6. Data extraction

A data extraction sheet was designed and used to extract the relevant information from the eligible studies. This included: 1) author & year; 2) country of study; 3) study design; 4) intervention used including specific characteristics of the intervention; 5) participant sample size and characteristics; 6) outcome measures; 7) retention and/or turnover data; 8) other outcomes.

2.7. Data synthesis

Following data extraction and quality analysis, key features and findings of included studies were reviewed and iteratively discussed by three authors (JB, RW, LA) to establish the structure of the synthesis of the study findings. Due to the heterogeneity of the studies and the nature of the question, meta-analysis was not performed. Instead a narrative summary of the characteristics of the different interventions was conducted. Specific detail such as sample size, outcome measures and intervention design are presented in Tables S1–S6, which are organised according to intervention type.

Retention/turnover data were used to guide the comparison between studies. The change in retention/turnover was calculated by subtracting the pre-intervention/comparison group data from the post-intervention/target group data. Therefore, negative numbers reflect a decrease in retention and/or an increase in turnover. To identify the benefits achieved by each of the interventions in regard to our outcomes of retention and turnover, data were summarised using appropriate measures of central tendency and dispersion, based on the normality of the data. Using these data, identification of the intervention elements that were successful was possible.

3. Results

3.1. Identification of papers

A total of 11,656 papers were identified through database searches, and an additional 8 papers were found from the reference lists of identified studies (Fig. 1). After duplicates were removed, 3252 papers remained which were screened by abstract and title. After applying eligibility criteria to abstract and title, 3033 papers were excluded leaving a total of 108 papers for full text assessment. A further 55 papers were excluded, leaving 53 papers for inclusion in the review. Included studies are outlined in Table 2; turnover and retention data are detailed in Table 3.

3.2. Critical appraisal

No studies were excluded on the basis of quality appraisal and the implications of this are noted in the discussion section. Fifty-two papers were appraised using the adapted JBI checklist for Quasi-experimental studies and 1 was appraised using the checklist for Randomised Controlled Trials (RCTs). Out of a total potential score of 9 for quasi-experimental studies, 8 studies

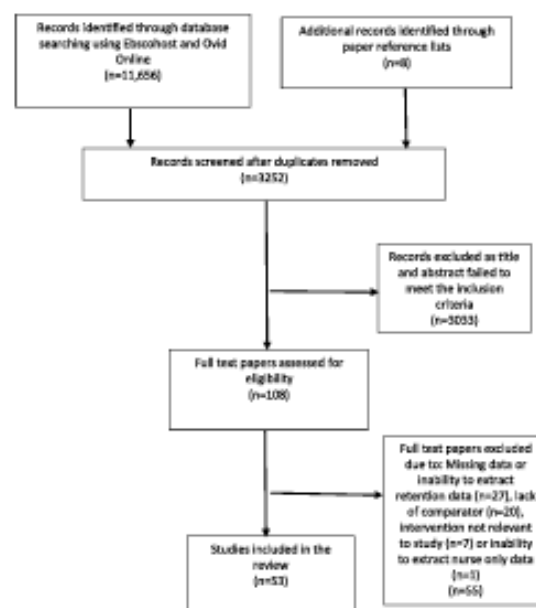


Fig. 1. PRISMA Flow diagram (Moher et al., 2009) of literature search and results.

scored 7 or above and 32 scored 4–6. Twelve studies scored 3 or below (Leigh et al., 2005; Shemont and Krepcio, 2006; Zucker et al., 2006; Pine and Tart, 2007; Trice et al., 2007; Keahey, 2008; Mills and Mullins, 2008; Scott and Smith, 2008; Morris et al., 2009; Hillman and Foster, 2011; Kooker and Kamikawa, 2011; Vergara, 2017). The one RCT study scored of 7 out of a possible 13. Low appraisal scores were frequently influenced by an absence of information. Nine of the studies were unclear whether participants in the comparison and intervention groups were similar or received similar treatment other than exposure to the intervention. Nine of the studies were unclear or did not include multiple measurements of retention or turnover pre and post intervention. None of the 12 studies reported how turnover or retention was calculated, and 11 of the 12 studies were unclear whether the outcomes of the participants in comparison groups were measured in the same way as the intervention group.

3.3. Study characteristics

Fifty-three studies were included in this review. Fifty-two of the studies were conducted in English-speaking countries (United States of America: n=48; Australia: n=2; Canada: n=1; United Kingdom: n=1). The remaining study was carried out in Taiwan but published in English. The majority of the interventions were designed to target newly graduated nurses (n=30); 10 interventions were designed for nurses at any stage of their career; 5 for newly hired nurses; 4 for newly licensed/qualified nurses who had taken the national nursing exam in order to become a licenced practitioner; and 4 for nurses with no experience in a particular speciality.

The hospitals size in which the interventions took place ranged from 12 to 1800 beds. Eleven studies reported interventions in children's hospitals and 8 were multi-site studies including a mixture of specialities.

Thirty-nine studies provided data on the number of nurses taking part in the intervention. Sample sizes ranged from 3 to 6000 with a median of 90 (IQR 163). Turnover was reported in 35 studies, retention in 16 and both retention and turnover data were reported in 2 of the studies.

Table 2
Included studies (n=53).

Author, Year & Country	Design	Sample Size for retention /turnover	Quality Score	Intervention	Duration of intervention	Main Findings in relation to retention and turnover
Allen et al., 2010, USA	Time series non-equivalent control group	1499 nurses	5/9	Nursing advancement programme	Variable	Turnover (2006) was 9.4% less for the intervention group
Almada et al., 2004, USA	Nonequivalent control group Pretest posttest	All nurses hired during two specific time periods	4/9	Preceptorship programme	8 weeks with support to 1 year	Overall hospital retention increased by 29% from pre (April 2000) to post (May 2001) intervention; newly graduated nurse retention increased by 68%
Anderson et al., 2009, USA	Nonequivalent control group pretest posttest	120 nurses	6/9	Residency programme	1 year	25% improvement in retention pre (2001) to post (2006) intervention and 11% improvement in retention from pre (2001) to post (2007) intervention
Baggot et al., 2005, USA	Time series design	All registered nurses	7/9	Preceptor action days	< 4 weeks	3.9% reduction in turnover from pre (2001) to post (2004) intervention.
Beecroft et al., 2001, USA	Nonequivalent control group posttest only	68 nurses	7/9	Internship in paediatrics	26 weeks	22% reduction in turnover compared to control group, measured over 12 month period
Beyea et al., 2010, USA	Time series nonequivalent control group	260 newly graduated nurses	5/9	Nurse residency programme	12 weeks	7.8% decrease in turnover at 1 year post intervention and 9.3% at 2 years post intervention
Blegen et al., 2015, USA	Time series nonequivalent control group	405 newly licensed nurses	5/9	Transition to practice programme	26 weeks	6% increase in retention in interventions with high levels of preceptor support compared to interventions with low levels of preceptor support.
Bonczek et al., 2016, USA	Pretest posttest	399 Newly hired nurses	4/9	Holistic approach workshops	4 weeks	1.5% increase in retention from pre (one year prior to the study) to post (during the study period) intervention
Berube et al., 2012, Canada	Time series	67 nurses	6/9	Critical care nurse residency programme	52 weeks	30% increase in retention pre (June 2005-March 2008; 3-year average) and post (June 2008-March 2011; 3 year average)
Bullock et al., 2011, USA	Pretest-posttest Quasi experimental	651 newly hired nurses	5/9	Orientation programme	52 weeks	31.1% decrease in turnover from pre (2007) to post (2009) intervention.
Cantrell and Browne, 2005, USA	Time series	193 newly graduated nurses	6/9	Externship	10 weeks	8.8% increase in turnover for intervention group; of the 193 nurses who completed the externship, 153 accepted a graduate nurse position at the institution
DiMeglio et al., 2005, USA	Time series design	All nurses on 6 inpatient units	5/9	Team building intervention	>4 weeks	3% decrease in turnover from pre (April 2002-September 2002) to post (October 2003-March 2004) intervention
Drenkard and Swartwout, 2005, USA	Nonequivalent control group pretest posttest	268 clinical ladder promoted nurses	5/9	Clinical Ladder programme	Variable	10.8% decrease in turnover pre intervention to post intervention; turnover was 8.9% less for those on the clinical ladder programme
Baron and Poeltler, 2007, USA	Pretest-posttest	77 new graduate nurses	6/9	Orientation Programme	52 weeks	13% decrease in turnover pre (July 2003-June 2004) to post (October 2004 – July 2005) intervention.
Figueroa et al., 2015, USA	Nonequivalent control group posttest	343 nurses	4/9	Preceptorship programme	18 weeks	9.5% improvement between turnover in intervention group and cohort 1; 23.1% improvement between intervention group and cohort 2
Fox, 2010, USA	Time series non-equivalent control group	All nurses in hospital	4/9	Mentorship programme	52 weeks	15.4% decrease in turnover pre (2005) to post (2006) intervention; 18.23% decrease in turnover pre (2005) to post (2007) intervention; 10.7% decrease in turnover pre (2005) to post (2008) intervention
Friday et al., 2015, USA	Time series design	60 newly graduated nurses	4/9	Externship and residency programme	52 weeks	4% decrease in retention at 1 year for externship and internship; 14% decrease at 2 years.
Friedman et al., 2013, USA	Time series nonequivalent control group	49 nurses	8/9	Paediatric orientation programme	52 weeks	12% improvement in retention across all paediatric nurses pre and post intervention.
Friedman et al., 2011, USA	Time series nonequivalent control group	90 nurses	9/9	Critical care orientation programme	52 weeks	20% increase in retention in intervention group (critical care orientation) versus control group (standard orientation)
Cohenbach, 2004, USA	Time series	Open to all nurses in the Emergency Department	5/9	Empowerment model	Ongoing	Pre intervention: 2.96 nurses leaving per month; Post intervention: 1.64 nurses leaving per month - Mean difference: 0.132
Halfer, 2007, USA	Time series	296 newly graduated nurses	4/9	Internship	52 weeks	12.2% decrease in turnover pre (2002) to post (12 months after) intervention
Halfer et al., 2008, USA	Nonequivalent control group pretest posttest	212 newly graduated nurses	6/9	Internship	52 weeks	8% decrease in turnover pre (2001-2002) to post (2003-2005) intervention
Harrison and Ledbetter, 2014, USA	Nonequivalent control group pretest posttest	461 newly licenced nurses	5/9	Nurse residency programme	52 weeks	2% increased turnover for intervention site at 1 year post intervention compared to control sites.

Table 2 (Continued)

Author, Year & Country	Design	Sample Size for retention /turnover	Quality Score	Intervention	Duration of intervention	Main Findings in relation to retention and turnover
Hillman and Foster, 2011, USA	Time series design	251 newly graduated nurses	2/9	Transition to practice programme	16 weeks	22.5% increase in retention pre (1 year before intervention) to post (5 years after adoption of intervention).
Hinson and Spatz, 2011, USA	Pretest posttest	All newly employed nurses	5/9	Retention collaborative	Ongoing	13.36% reduction in turnover from pre intervention (2007) to post intervention (2008); 2.69% reduction in turnover from pre intervention (2007) to post intervention (2009).
Keahey, 2008, USA	Nonequivalent control group posttest	5 nurse participants	2/9	Nurse residency programme	36 weeks	40% increase in retention from pre intervention to post (2 years after intervention).
Kooker and Kamikawa, 2011, USA	Time series design	All nurses	1/9	New nurse fellowship programme	24 weeks	12.23% increase in retention from pre (2005) to post (2009) intervention
Kozub et al., 2015, USA	Nonequivalent control group posttest	42 newly hired nurses	7/9	Orientation programme	6–16 weeks	Improvement of 20% from pre (previous 2-year retention) to post (current 2-year retention) intervention.
Latham et al., 2011, USA	Nonequivalent pretest posttest non control group	All nurses in hospitals 1 and 2	5/9	Mentor programme	>4 weeks	21% increase in retention for Hospital 1 pre intervention to 3–4 years after; 17.07% increase in retention for Hospital 2 pre intervention to 3–4 years after
Lee et al., 2009, Taiwan	Pretest posttest	224 newly graduated nurses	6/9	Preceptorship programme	12 weeks	Reduction in turnover of 17.7% from pre-intervention (March 2006) to during 6-month study period (August 2006)
Leigh et al., 2005, UK	Time series design	201 newly graduated nurses	3/9	Preceptorship programme	30 weeks	9% decrease in turnover at 12 months post intervention; 4% at 24 months post intervention
Marcum and West, 2004, USA	Pretest posttest	20 nurses	4/9	Structured orientation	26 weeks	11% decrease in turnover from pre to post (18 months after intervention)
Meraviglia et al., 2008, USA	Time series	1150 nurses	4/9	Nurse friendly criteria and policies	Ongoing	2.7% decrease in turnover from pre (2004) to post (2006) intervention
Mills and Mullins, 2008, USA	Nonequivalent control posttest	All newly hired nurses	1/9	Mentor programme	Not clear	15% lower turnover for intervention group compared to nurses who did and did not take part in the intervention
Morphet et al., 2008, Australia	Nonequivalent control posttest	87 newly hired nurses	5/9	Orientation programme	52 weeks	Short term retention (12 months) increased by 37% for intervention group versus control group; long term retention (nurses who stayed in emergency nursing, regardless of location) increased by 49.7%
Morris et al., 2009, USA	Time series non-equivalent control group	All ICU nurses (control); 197 newly hired nurse (intervention)	3/9	Orientation programme	7 weeks	1.9% increase in retention from pre (May 2005) to post intervention (August 2006); 2.5% decrease in turnover
Newhouse et al., 2007, USA	Nonequivalent control group posttest only	377 newly graduated nurses (intervention) 115 newly graduated nurses (control)	7/9	Internship	52 weeks	8% improvement in retention for intervention group versus comparison group at 18 months post intervention; 12% improvement in retention at 24 months
Olson-Sitki et al., 2012, USA	Time series	All newly graduated nurses	6/9	Nurse residency programme	12 weeks	5% decrease in turnover from 1 year pre to 1 year post intervention; 8% decrease in turnover 2 years pre to 1 year post intervention; 4% decrease in turnover 2 years pre to 2 years post intervention
Orsini, 2005, USA	Non-equivalent control group pretest posttest	All nurses in hospital (control) 3 newly graduated nurse participants (intervention)	5/9	Orthopaedic transition to practice programme	12 weeks	14.9% reduction in turnover for intervention group compared to comparison group (whole hospital)
Pine and Tart, 2007, USA	Pretest posttest	All newly graduated nurses	2/9	Nurse residency programme	52 weeks	37% decrease in turnover from pre (2003) to post (2005) intervention
Porter and Kolcaba, 2010, USA	Pretest posttest	1443 nurses (pretest) 1695 nurses (posttest)	7/9	Nursing labour management partnership intervention	Ongoing	3.1% decrease in turnover from pre (2005) to post (2008) intervention
Rickard et al., 2012, Australia	Pretest posttest	Total nursing workforce in two hospitals	4/9	Workload intervention	Ongoing	Hospital 1: 17% decrease in turnover from pre (2004) to post (2010) intervention; Hospital 2: 15% decrease in turnover from pre (2004) to post (2010) intervention
Schoessler and Waldo, 2006, USA	Time series	All newly graduated nurses	4/9	Orientation programme	104 weeks	28% decrease in turnover from pre (1998) to post (2003) intervention
Scott and Smith, 2008, USA	Time series	87 newly graduated nurses	3/9	Transition to practice programme	52 weeks	10.7% decrease in turnover from pre (2002) to post (2005) intervention
Shermont and Krepcio, 2006, USA	Pretest posttest	All newly hired nurses	3/9	Orientation programme	Variable	50% reduction in turnover from pre (2001/2002) to post (2002/2004) intervention
Silvestre et al., 2017, USA	Randomised controlled multi-site	1032 nurses	7/13	Transition to practice programme	26 weeks	Intervention group turnover rate 15.5%, control group turnover rate 26.8%
Trepanier et al., 2012, USA	Pretest posttest	524 newly graduated nurses	6/9	Nurse residency programme	Unknown	Data averaged across 15 hospitals: 29.63% mean decrease in turnover from pre (12 months) to post (12 months) intervention

Table 2 (Continued)

Author, Year & Country	Design	Sample Size for retention /turnover	Quality Score	Intervention	Duration of intervention	Main Findings in relation to retention and turnover
Trice et al., 2007, USA	Nonequivalent control group posttest only	38 newly graduated nurses (intervention) 28 Newly graduated nurses (control)	3/9	Externship and internship	30 weeks	21% improvement in retention from 2 years pre intervention to post intervention.
Ulrich et al., 2010, USA	Time series	6000+ newly graduated nurses	7/9	Nurse residency programme	52 weeks	19.9% decrease in turnover from pre intervention compared to post (12 months post recruitment); 29.4% decrease in turnover from pre intervention compared to post (24 months post recruitment) 4% decrease in turnover from 2014 to 2015
Vergara, 2017, USA	Pretest posttest	All staff in one critical care unit	2/9	Critical care mentor programme	26 weeks	
Williams et al., 2002, USA	Non-equivalent control group pretest posttest	nurses in 9 intensive care units	5/9	Nurse residency programme	30 weeks	For intervention group: Mean change in turnover = decrease of 9.3%; for non-intervention group: Mean change in turnover = increase of 14.5%.
Wright et al., 2017, USA	Pretest posttest	3000+ nurses	4/9	Self-scheduling programme	Ongoing	1.9% mean decrease in turnover across 4 hospitals. Hospitals A and D increase in turnover; hospitals B and C, decrease in turnover.
Zucker et al., 2006, USA	Pretest posttest	260 newly graduated nurses across 5 hospitals	1/9	Mentor programme	78 weeks	13% increase in retention 6 months post intervention compared to pre intervention; 12.4% decrease in turnover

Table 3

Turnover and retention data summary.

	Sample size	Turnover (% improvement/difference)					Retention (% improvement/difference)				
		Effect	Mean	Median	IQR	Min-Max	Effect	Mean	Median	IQR	Min-Max
Length of intervention											
< 4 weeks	300-400+	2 positive	3.4	3.4	0.4	3-3.9	–	–	–	–	–
4-26 weeks	3-1032	11 positive / 1 negative	10.8	9.3	7.1	1-23.1	5 positive	8.8	6	10.3	1.5-22.5
27-52 weeks	5-6000+	9 positive / 1 negative	16.5	13.3	8.4	4-37	11 positive / 2 negative	25.4	21	21.5	5-68
> 52 weeks	NR	1 positive	–	–	–	12.4	1 positive	–	–	–	13
Variable	42-70	1 positive	–	–	–	54	1 positive	–	–	–	20
Ongoing	1856-5400	6 positive	12.7	10.8	5.67	2.7-38	–	–	–	–	–
Type of intervention											
Preceptorships	123-400	4 positive	11.2	9.2	10.4	4-23.1	–	–	–	–	–
Mentorships	12-450	5 positive	12.6	13.7	4.2	4-18.2	2 positive	17.0	17.1	4	13-21
Residency programmes and Internships	31-6000+	8 positive 1 negative	18.1	18.6	19.2	1-37	4 positive 1 negative	24.2	19.5	18.5	5-68
Externship/ Externship + nurse residency	100-153	1 negative	–	–	–	–	1 positive / 1 negative	–	–	–	21
Orientation & Transition to Practice	3-1032	9 positive	17.6	13.6	10.6	2.5-50	7 positive	13.3	12	11.5	1.9-22.5
Clinical ladder/advancement	33-478	2 positive	11.4	11.4	2	9.4-13.4	–	–	–	–	–
Other	89-1856	7 positive	7.4	5.4	7.4	1.9-17	2 positive	6.9	6.9	5.4	1.5-12.2
Characteristics of intervention											
Preceptor component	3-1032	13 positive	14.3	9.5	8.7	1-50	9 positive / 1 negative	22.7	20.5	18.2	1.9-68
Mentor component	12-524	7 positive / 1 negative	14.0	13	4.7	4-29.6	2 positive	17.0	17.1	4	13-21
Both preceptor and mentor component	50-6000+	5 positive	19.8	19.9	4.8	10.7-29.4	3 positive / 1 negative	14.6	12	9	5-25
Incentives	20-2400	8 positive	11.8	11	4.2	2.7-18.2	3 positive / 1 negative	15.4	15.0	8.5	5-25
Teaching/training	3-6000+	21 positive / 1 negative	15.1	11.85	10.8	1-50	16 positive / 2 negative	23.8	20	18	1.5-80
Assessment	3-6000+	14 positive	12.0	10.1	8.4	1-29.4	9 positive / 1 negative	19.7	14	14	1.9-68
Speciality tracks	3-260	7 positive / 1 negative	9.1	9	9	2.5-17.2	5 positive	16.3	17	7.5	1.9-30

IQR = Interquartile Range.

* Sample size was not reported precisely in the original paper.

The narrative summary presents two approaches. First, studies were analysed according to the assignment of the authors to the intervention (descriptions of the different types of interventions are provided in Table 1). Due to considerable overlap between different types of interventions, the second analysis categorised studies based on the description of the components of the intervention. This was conducted to ascertain the influence of specific components on the outcome. For example, an intervention may have been labelled as a residency programme but involved mentorship of participants. What follows is a systematic report of

the impact of both the interventions and their constituent components on nurse retention and turnover.

3.4. Type of components

Components that were detailed in the most studies (i.e. over 10 studies evaluating them) include intervention lengths between 4–26 weeks ($n = 16$) and 27–52 weeks ($n = 21$); interventions with a preceptor component ($n = 30$), incentives ($n = 10$), a teaching component ($n = 37$) and an assessment component ($n = 21$).

3.4.1. Preceptor component

A larger number of studies reported interventions with a preceptor component ($n = 22$) and of these, 13 evaluated turnover with an average 14% decrease in turnover. The 9 studies that measured retention found an average 23% increase in retention. Friday et al. (2015) was the notable exception, with a 4% decrease in retention at 1 year after the intervention and a 14% decrease at 2 years post intervention.

3.4.2. Mentor component

Nine studies reported that the interventions included a mentor component. Seven of these provided turnover data, with a 14% average decrease in turnover across the studies, and one reporting a 2% increase in turnover (Harrison and Ledbetter, 2014). Retention data was reported by 2 studies and retention improved by an average of 17% across these studies.

3.4.3. Both preceptor and mentor component

Eight studies described interventions that offered both a mentor and preceptor component, 4 scoring 7 or above in the quality assessment (Beecroft et al., 2001; Friedman et al., 2011, 2011; Ulrich et al., 2010). Five of these studies provided turnover data and found that the interventions led to an average decrease in turnover of 20%. Three studies looked at retention and found an average of 15% improved retention. However, Anderson et al. (2009) reported a 1% increase in turnover but this was after changes were made to an established intervention programme.

3.4.4. Teaching/training component

Thirty seven of the 53 interventions had a teaching component, often including a combination of classroom based teaching, simulated practice and clinical immersion. Twenty-one studies found an improvement in turnover, with 15% average decrease across studies. Across the 16 studies that measure retention, there was an average of 24% increase in retention. However, 3 studies with a teaching/training component found negative effects of turnover and retention (Anderson et al., 2009; Friday et al., 2015; Harrison and Ledbetter, 2014).

3.4.5. Assessment component

Twenty-one studies incorporated a formal assessment component and 4 scored 3 or less in the quality assessment (Leigh et al., 2005; Morris et al., 2009; Trice et al., 2007; Zucker et al., 2006). Fourteen of the studies found an improvement in turnover ($M = 12.0$; $SD = 7.2$). Across 9 studies an average of 20% increase in retention was found.

3.4.6. Incentives component

Incentives were used to attract nurses to a position or tempt them stay in the role or organisation. Incentives included financial benefits such as payment to attend certain meetings or training (Faron and Poeltler, 2007; Lee et al., 2009) promotion or pay rise (Allen et al., 2010; Drenkard and Swartwout, 2005) and bonus payments to reward loyalty (Fox 2010, Marcum and West, 2004; Zucker et al., 2006). Ten studies found a positive effect of incentives on turnover and retention and all but 1 (Zucker et al., 2006) scored above 3 in the quality assessment. On average, turnover decreased by 12% and retention increased by 15%. However, Anderson et al. (2009) reported the positive effect of offering a financial reward for nurses staying for more than 2 years but found an increase in turnover after 2 years.

3.4.7. Intervention length

The length of the interventions varied from 1 day to interventions that were ongoing. Analysis of interventions length was grouped as follows: 1) less than 4 weeks 2) 4–26 weeks; 3) 27–

52 weeks; 4) over a year; 5) ongoing; 6) varies depending on the nurse. Studies reporting negative effects were Cantrell and Browne (2005) reporting increased turnover of 8.8% following a summer externship lasting 10 weeks and three studies of 27–52 weeks. Harrison and Ledbetter (2014) found an increased turnover of 2% for the hospital that had a nurse residency programme, compared to two control hospitals. Friday et al. (2015) found that nurses who did an externship and internship were less likely to stay at the hospital (4% decrease in retention at 1 year; 14% decrease at 2 years). Furthermore, Anderson et al. (2009) found that a residency programme of this length led to improved retention from 2001 to 2007, however, after the residency programme was revised, retention fell by 1%.

The largest number of studies lasted between 27 and 52 weeks ($n = 21$). Only two studies evaluated interventions that lasted over 52 weeks and in these, turnover decreased by 12.4%, retention improved by 13%.

3.5. Types of intervention

Types of interventions that were most frequently evaluated in this review are residency programmes/internships ($n = 16$), orientation and transition to practice programmes ($n = 15$), and interventions with a speciality track ($n = 12$).

3.5.1. Preceptorship programmes

Four studies evaluated the impact of preceptorships on turnover and found turnover decreased an average of 11% across studies ($SD = 7.7$) (Table S1). All but one study scored above 3 in the quality assessment process.

3.5.2. Mentorship programmes

Five studies provided turnover data for mentorships, and turnover was reduced by an average of 12%. Two studies looked at retention data and found a 17% increase in retention on average. However, three of these studies scored 3 or less in the quality assessment (Mills and Mullins, 2008; Vergara, 2017 and Zucker et al., 2006) (Table S2).

3.5.3. Residency programmes and internships

Sixteen studies reported findings from residency programmes and internships, with 3 scoring 3 or less in the quality assessment. Ten studies looked at turnover and found an average 18% decrease. Six studies examined retention and found an average increase of 24%. However, two of these studies found a negative impact on turnover and retention: Anderson et al. (2009) found a 1% decrease in retention and Harrison and Ledbetter (2014) found an increased turnover of 2%.

3.5.4. Externships

Three studies examined the impact of externships, either alone (Cantrell and Browne, 2005), in combination with a nurse residency programme (Friday et al., 2015), or with an internship (Trice et al., 2007). All but 1 study (Trice et al., 2007) scored between 4 and 6 in the quality assessment. The two studies that included an externship in combination with other interventions found a positive effect. Friday et al. (2015) found that an externship and nurse residency programme, in comparison to a standalone nurse residency, led to decreased turnover at year 1 (4%) and year 2 (14%) but found no differences in scores on the Casey-Fink nurse experience survey (Casey et al., 2004) between the two groups, indicating that the decrease in turnover was not related to perception of the experience of the externship and residency programme. Trice et al. (2007) found that of those nurses who had completed a nursing internship and externship between 1999 and 2005 had a retention rate of 89% at 2 years, compared to those who

just did the internship in 2007, who had a retention rate of 68%. However, nine of these interns had not reached their 2-year mark yet, making comparisons difficult. The one study that looked at the impact of an externship as a single intervention on turnover found a negative outcome: turnover in the externship group was 9% higher than the control group (Cantrell and Browne, 2005) (Table S6).

3.5.5. Orientation and transition to practice programmes

Fifteen studies examined turnover and retention in relation to orientation and transition to practice programmes and found an average decrease of 18% in turnover, and a 13% increase in retention. Four of these studies scored 3 or less and 5 scored 7 or above in the quality assessment.

3.5.6. Speciality tracks

Twelve studies evaluated interventions that offered speciality training. Seven were interventions designed for specific clinical specialities, such as critical care ($n=5$); specialist care ($n=1$); or orthopaedic care ($n=1$). Five described speciality tracks which could be adapted depending on the clinical area; all interventions included pairing with mentors who trained them in their clinical specialism. Speciality tracks were used to ease the transition from one clinical area to another (Morris et al., 2009; Vergara, 2017), or support the integration of newly qualified nurses in to areas of specialism. Speciality tracks were components in residency programmes, transition programmes, orientation programmes, preceptorship programmes and internships.

Three of these studies scored 7 or above and 3 scored 3 or less in the quality assessment. Across seven studies an average of 9% decrease in turnover was found. Retention increased by an average of 16% across five studies. One study found a negative effect of having a speciality track component on turnover (Harrison and Ledbetter, 2014).

3.5.7. Clinical ladder or advancement programmes

Two studies looked at clinical ladder/advancement programmes and found an average of 11% decrease in turnover (Table S5).

A range of interventions were examined in the remaining studies, including a team building approach (DiMeglio et al., 2005), a nurse friendly hospital project (Meraviglia et al., 2008) and a new nurse fellowship (Kooker and Kamikawa, 2011), however there was insufficient similarity in intervention characteristics to enable comparisons (Table S6).

4. Discussion

This systematic review was conducted to identify the characteristics of interventions that improved the retention of nurses within clinical practice. A wide variety of interventions and components within those interventions have been identified to improve nurse retention. In this review, the number of studies that examined each component of an intervention was variable.

Two key characteristics of effective interventions appear to be mentorship and preceptorship. Friday et al. (2015) found a negative effect for turnover, but this was for nurses who took part in both an externship (no preceptor) and an internship (with a preceptor) versus those who just took part in the internship, and therefore it is unlikely the preceptor component influenced the results.

The effects of preceptorship on new nurses has previously been explored systematically, concluding that there was insufficient evidence to support the beneficial effects of preceptorship on professional socialisation, job satisfaction or retention, but significant positive effects on new nurse competence (Ke et al., 2017). A period of support following qualification has also been

recognised as important (Whitehead et al., 2013) identifying that key to success is the quality of the preceptorship/preceptee relationship. This relationship can be developed if preceptors are supported through structured training and peer support (Adlam et al., 2009). The fact that newly qualified nurses feel that a period of preceptorship is essential (Higgins et al., 2010) suggests that nurses will seek to be employed by an organisation that provides preceptorship as it indicates commitment to their career development (Edwards et al., 2015). This in turn may lead to positive effects on retention and turnover such as we have found. Increases in competence may also lead to increases in confidence and greater job satisfaction (Edwards et al., 2015), which is again linked with lower turnover (Twigg and McCullough, 2014).

Interventions with both a preceptor and mentor component appear to have merit, although the results are not consistent. Inclusion of both mentorship and preceptorship appears to have a larger impact on turnover, with an average decrease of 20% across the 5 studies that measured turnover, compared to a decrease of 14% across the 13 studies that described standalone preceptorship components. Conversely, this review found an average 15% increase in retention for those interventions with both preceptor and mentor components and an average 23% increase for those with preceptors only.

Mentorship is an established mechanism for support in early career nursing, with the mentor/mentee relationship again central to the success of the intervention. Mentorship programmes can take many forms and there are debates between advocates of random matching of mentor and mentee and those that favour pairing based on the rigorous consideration of specific characteristics of the participants (Zhang et al., 2016). Appropriate fit is clearly considered important and, although there is no consensus in the literature on how this should be achieved, similarities between personality, experience and opportunity to interact will influence the quality of the relationship (Nowell et al., 2016). Given the importance of the relationship to the outcome, it would seem prudent to consider the characteristics of the individuals involved. In this review three studies employed organised pairing and two allocated with random or unspecified pairing methods; all reported a positive effect. In addition, the contribution to successful maintenance of the relationship made by the regularity of the mentor/mentee meetings and clarity of mentoring objectives should not be underestimated (Zhang et al., 2016).

The diversity of the mentoring and preceptorship components considered in this review make conclusions difficult to draw but the key characteristics of many programmes such as networking and socialisation in the profession, together with a nurturing and developmental relationship, are consistently linked to positive practice environments and increased retention (Twigg and McCullough, 2014; Lartey et al., 2014). As many preregistration nursing courses also include elements of mentorship, newly qualified nurses may be familiar with the dynamic of a mentoring relationship and be able to use it to maximum effect.

A promising component of an intervention appears to be teaching/training. The taught element was evaluated in 37 studies with a generally positive effect on retention and turnover. These findings concur with those of other reviews where increases in competence, knowledge and confidence were identified as important effects of interventions to support newly qualified nurses (Edwards et al., 2015; Ke et al., 2017).

Although there is acknowledgement that newly qualified nurses need to continue to develop competence and knowledge (Berkow et al., 2009), there is no agreement on the best approach for acquiring these capabilities (Al-Dossary et al., 2014). The interventions studied in this review utilised a variety of approaches to teaching nurses, either formally or informally, in the classroom or via clinical immersion in simulated or live

settings, making comparisons and clear conclusions difficult. Furthermore, three studies found a negative impact of these interventions on turnover and retention. It is unclear whether the negative impact was linked to the teaching element of the intervention because empirical research in this area to demonstrate causation is weak (Irving et al., 2018). What may be important is a defined structure to the teaching and a managerial support framework to underpin the delivery (Irving et al., 2018). Success will be dependent on a system of line management that recognises the time commitment and support required for endeavours such as teaching of newly qualified nurses to take place effectively (Whitehead et al., 2013).

Whilst it may be assumed that the longer the intervention, the more likely it is to be effective, the results of this and previous reviews indicate that even shorter interventions have an effect (Salt et al., 2008). Interventions lasting between 4–26 weeks and 27–52 weeks were the most highly evaluated but those lasting between 27–52 weeks had the most beneficial effect on retention and turnover.

Newly qualified nurses often have unrealistic expectations of their new role (Higgins et al., 2010), leading to frustration and demoralisation, potentially linked to short-lived lack of confidence (Maben et al., 2007). In this review, Anderson et al., (2009) found that job satisfaction scores for newly qualified nurses dropped at one year after qualification, despite increases in perception that they could perform more effectively and had developed effective work relationships. At two years post qualification the nurses' job satisfaction had increased again. Newly graduated nurses often feel that they still need further support and mentoring after their transition or orientation programme has been completed and may leave the organisation in anticipation of greater support elsewhere (Almada et al., 2004).

This may be related to unrealistic expectations of their ability (Mooney, 2007) and so preparation for transition to registration could involve further contextualisation to meet their specific needs. Potentially, there is a critical time span in which newly qualified nurses reassess the reality of the role, move out of the stage of conscious incompetence and acquire confidence. If confidence is something that cannot be taught but must be developed over time (Whitehead, 2001), the timeframe is particular to the individual nurse and as such the optimum intervention length for greatest effect is an area that warrants further research.

Salt et al., (2008) indicated that interventions with more than one component were most effective. Strategies that incorporated several methods of education, including classroom instruction, observational experience, coaching and computer-based learning, together with a strong preceptor element designed to provide one to one guidance for the newly qualified nurse were optimal. In the last ten years, developments in e-learning have resulted in greater understanding of the benefit for novice nurses from this component when used as an adjunct to traditional methods (Feng et al., 2013). More recently, a combination of both didactic and clinical taught elements in combination with well prepared and supported mentors or preceptors is advocated to ease the transition from student to qualified nurse (Edwards et al., 2015; Rush et al., 2012). Research exploring the perspective of newly qualified nurses indicates that a combination of opportunities to connect with peers with healthy work environments is also influential to the success of the intervention (Rush et al., 2012; Mooney, 2007). Although there is no consensus in the literature about the formulation for optimal effectiveness it would seem that, in keeping with the findings from this review, multi-faceted interventions that combine elements that focus on building competence and confidence, such as teaching, with those that focus on socialisation and embedding the new nurse into the work

environment, such as mentoring or preceptorship, may be effective at retaining nurses.

4.1. Recommendations

Despite concerns about the quality of study reporting and the distribution of the data, some suggestions about potentially successful interventions can be made. Interventions with the highest benefit appear to be an internship/residency programme or an orientation/transition to practice programme that incorporates formal teaching, a preceptorship element and possibly the addition of a mentorship element, lasting 27–52 weeks in duration. Consistent with the fact that most of the included studies originated in high income economies, these findings align with support that is already offered in USA, Canada and Australia. The elements of preceptorship and mentorship are also embedded in UK nursing culture (Irwin et al., 2018). What is of interest is not the novelty of these interventions but rather the understanding that to develop and refine already established transition programmes, focus could be on the elements of teaching, preceptorship and mentorship and considering how these can constitute a combined offer. As variation in the quality of mentors, preceptors or teaching will affect the outcome of the programme of support and in turn impact on retention or turnover, we suggest review of these practices may be beneficial. When refining established provision, inclusion of all elements where feasible may be prudent.

Healthcare systems internationally are subject to funding restraints and astute fiscal decisions are paramount; these findings help to inform policy and practice related to retention of early career nurses. Given that even the shortest interventions had a positive effect, further cost-benefit analyses to determine where the point of maximum benefit for minimal financial outlay lies would be beneficial, although the complexity of the benefit of these interventions in terms of increased confidence, competence and patient satisfaction may not be easily captured using economic analysis tools.

It is clear that support for early career nurses is important to encourage retention and if the requirement for this support were to be enshrined in either local or national policy, early career nurses would feel more confident about their transition from student to qualified practitioner. The results of this review offer policy makers guidance for the development of such strategy.

Future research should focus on evaluating the intervention components identified as promising with high quality research methodology. First, standardised outcome measures should be used so that comparisons can be made across studies. This would include identifying an algorithm to calculate turnover and retention for parity and using statistical analyses to identify if the differences between groups are statistically significant. Second, future studies should report participant characteristics of both intervention and control groups and examine the importance of baseline differences. Detail of the reasons for participants leaving their post would also enable more effective comparison. Third, consideration could be given to identifying sub-groups or strata in larger studies to determine the differential effect of the intervention on groups with particular characteristics. This may help explain or mitigate the highly dispersed results found in this review. Carrying out this research with high quality methodology will allow for conclusions to be drawn about the effectiveness of an intervention, and comparisons to be made across studies.

4.2. Strengths

The strength of this systematic review lies in the rigour of the process, which was conducted according to PRISMA guidelines. Secondary scrutiny of all papers prior to inclusion mitigated

subjectivity and clear criteria for quality assessment and data extraction reinforced this objective perspective. This is a large systematic review with consideration of over 11,000 papers and inclusion of 53. Subsequently the review has captured the characteristics of a wide range of interventions and the multiple reporting of some types of interventions in particular such as residency programmes or preceptorship, enhances the credibility of the findings.

4.3. Limitations, including methodological quality

Limitations that should be taken into account when considering the implications of the results include inconsistent and incomplete description of the interventions, missing detail of some components of the intervention, variations in sample size and the method of evaluation. As found in previous reviews (Ke et al., 2017; Edwards et al., 2015; Salt et al., 2008; Rush et al., 2012), the quality of the review is necessarily limited by the quality of the study reports that are available. Many of the studies were not conducted using rigorous research methods but we have chosen to include all studies that met the eligibility criteria to provide a complete description of the body of work. In addition, comparisons across studies were difficult to make due to variation in outcome measures (retention or turnover or both), the absence or presence of measurement of statistical significance and use of a range of validated or other measurement tools to assess additional outcomes. Even though many of the studies had large numbers of participants, measures of dispersion were also frequently large, suggesting highly heterogeneous characteristics. Very few of the papers reported negative findings, which may indicate that this topic is subject to publication bias, with those studies that found nil or negative effect not being submitted for or accepted for publication. Consideration of unpublished reports may have addressed this bias to some extent.

5. Conclusion

The characteristics of interventions that successfully influence retention of nurses within practice have been identified. Methodological issues impacted on the extent to which conclusions could be drawn, even though a large number of studies were identified. Despite this, promising interventions appear to be either internship/residency programmes or orientation/transition to practice programmes, lasting between 27–52 weeks, with a teaching and preceptor and mentor component. Future research should focus on standardising the reporting of interventions and outcome measures used to evaluate these interventions and carrying out further research with rigorous methodology. Clinical practice areas are recommended to assess their current interventions against these criteria to guide development of their effectiveness and evaluations of cost-effectiveness are considered an important next step.

Conflict of interest

None.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijnurstu.2018.11.003>.

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Table S1: Preceptorships (n = 4)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Almada, et al., 2004, USA	1. Newly graduated nurses. (Age: 21-55 M = 37 years) 2. 48 nurses 3. Quasi-experimental	- Vermont Nurse Intern Project - Minimum 8 weeks with a preceptor, and followed up for 1 year 2-week rotations to other departments 1 week classroom time - Participants are matched to a preceptor - Preceptors attend a full day of training	- Pre (April 2000) to post (May 2001) - Overall hospital retention increased by 29% - Newly graduated nurses' retention increased by 68% - High nursing satisfaction	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Figuerola, et al., 2013, USA	1. Newly graduated nurses 2. 108 nurses took part in the intervention, 100 preceptors, 45 nurses completing focus groups 3. Quasi-experimental	- Married state preceptorship 18 weeks long - RNs assigned an unmatched preceptor - Three phases: 1) 6 weeks working side to side; 2) 6 weeks, preceptor acts as shadow; 3) 6 weeks, preceptor at nursing station there if nurse needs them	- Pre (cohort 1 & 10) to post (cohort 10) - Improvement of 9.5% between the intervention group, and cohort 1 (pre-intervention) - Improvement of 23.1% between intervention group and cohort 2 (pre-intervention) - Focus groups showed that preceptors and RNs liked the model	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Lee, et al., 2009, Taiwan	1. Newly graduated nurses. Demographic data of those who	- Preceptorship programme 3 months long - RN assigned an unmatched preceptor - Preceptors are given 9 hours of classroom training, have monthly	- Pre-intervention (March 2006) to during 6-month stud period (August 2006) - A reduction in turnover of 17.7% - Non-significant increase in patient satisfaction	(S) Clear cause and effect; clear explanation of how turnover was measured (L) Not clear if pre and post nurses are similar enough to make comparisons

	completed the questionnaire: Age M = 23.4, 100% female, 67.6% college education, 91.1% single	discussions to raise any issues and get teaching allowances.	• Significant increase in attitudes of nursing staff • Decrease in adverse patient events (falling)	
	2. 123 nurses took part in the intervention, 34 nurses completed the questionnaire			
	3. Quasi-experimental			
Leigh, et al., 2005, UK	1. Newly qualified nurses	• Preceptorship programme • 3-week supernumerary orientation programme	• Pre to post intervention (12 months and 24 months) • A decrease in turnover of 9% at 12 months post intervention, and 4% at 24 months post intervention	S) Clear cause and effect, multiple measurements of turnover
	2. 201 nurses took part in the intervention, 27 RNs completed the questionnaires	• RNs assigned an unmatched preceptor for 30 weeks • Preceptors are given training • Preceptors assess RNs against defined competencies	• Majority of the nurses completed all the competencies • RN confidence increased	(L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
	3. Quasi-experimental			

KEY: * based on Joanna Briggs quality appraisal; RN = registered nurse

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Table S2: Mentorships (n = 5)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Fox, 2010, USA	4. Newly registered nurses 5. 12 pairs of nurses and mentors 6. Quasi-experimental	• Mentor scheme • 1 year • Mentors and RNs matched by educational background and personality show • Mentors and RNs meet at least 9 times a year • Mentors receive a bonus worth 3.5% of full time registered nurse salary	• Pre (2005) to post (2006): 15.4% decrease in turnover • 2005-2007: 18.23% decrease in turnover • 2005-2008: 10.7% decrease in turnover • 6.29% decrease in spending	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Latham, et al., 2011, USA	4. New hires (both new graduates and experienced nurses). Mentees (Age: M = 33 years; 10.9% male; average working 1.57-3.39 years as a nurse; 52.6% white, 31.77% Asian). 5. 109 mentees, 89 mentors 6. Quasi-experimental	• Formal mentoring programme • Two 8-hour interactive sessions • Mentees picked mentors based on video tapes, reading online profiles and meeting them for a 2-minute “speeding-dating” style meeting • Mentors attend extra sessions about the mentor-mentee relationship • Mentors role allows them consideration for promotion, and increase pay incentives	• Pre to 3-4 years after • Increase of 21% retention for Hospital 1 • Increase of 17.07% retention for Hospital 2 • Mentors reported improved teamwork and the ability to deal with conflict	(S) Clear cause and effect; clear explanation of how retention was measured (L) Not clear if pre and post nurses are similar enough to make comparisons
Mills and Mullins, 2008, USA	4. Newly graduated	• The California Nurse Mentor Project	• Nurses who did and did not take part in the intervention • Turnover reduced by 15%	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to

		nurses across 4 hospitals	• Mentors and mentees matched based on the shift schedules • Mentors given 22 hours of training	• Mentees enjoyed their relationship with their mentor • Focus groups suggested that there was increased job satisfaction	make comparisons; not explicitly stated how turnover was measured.
Vergara, 2017, USA	5. Quasi-experimental	450 nurses			
	6. Quasi-experimental	Nurses with no critical care experience	• Mentorship programme for specialist care nurses • 6 months • Nurses assigned a mentor • Monthly mentor/mentee meeting • Nurses have 222 hours of classroom time	• 2014-2015 • 4% decrease in turnover • Increased staff satisfaction	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Zucker et al., 2006, USA	1. Mentors		• Navigator programme	• 6 months before – 6 months after intervention	(S) Clear cause and effect
	2. Norton's 5 Hospitals		• 18 months • 3 training sessions in first 6 months, 2 in second 6 months and one in the final 6 months • Mentors given incentives at each time point. 6 months \$500; 12 months \$750; 18 months \$1,000. • Nurses given lunches, thank you notes, name tags, t-shirts, information on pay-checks, vacation, and a buddy system.	• 13% increase in retention • 12.4% decrease in turnover	(L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover or retention was measured.
	3. Quasi-experimental		•		

KEY: * based on Joanna Briggs quality appraisal; RN = registered nurse

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Table S3: Residency programmes and Internships (n = 17)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Anderson and Linden, 2009, USA	7. Newly graduated nurses 8. 90 nurses from 5 metropolitan hospitals 9. Quasi- experimental	- Nurse residency 12 months - Assigned a preceptor for 3 days - Preceptors provide teaching on 3 themes - Continual email communication with mentor - Nurse specialists provide newly graduated nurses feedback on their journal assignments - Nurses who stay at the hospital for 2 years were offered a financial reward	- Pre (2001) to post (2006, 2007) 25% improvement in retention (2001-2006) 11% improvement in retention (2001-2007) - Second part of the residency programme introduced in 2006. 5% improvement in retention from 2006 to “present” - Retention decreased by 1% from 2006 to “present” - Felt more confident and valued in their role	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how retention was measured.
Beecroft, et al., 2001, USA	7. Newly graduated nurses 8. 68 nurses hired for programme, 50 completed. 9. Quasi- experimental	- RN Internship in paediatrics programme 6 months - A mentor sponsors the new graduate, and they talk about difficulties and strategies to deal with these - Assigned a mentor for 716 hours - Clinical experience in other areas of the hospital 224.5 hours of classroom time	- Turnover measured during a 12 month period - Reduction in turnover by 22% compared to control group - Interns had a more realistic view of the ideal professional nurse, nurses felt more confident, felt committed to the organisation	(S) Clear cause and effect; both control and intervention group characteristics were reported; explanation of how turnover was measured was provided
Beyea, et al., 2010, USA	7. Newly graduated nurses 8. 17 cohorts, 260 participants:	- Nurse residency - Different tracks 12 weeks residency, however the time varied slightly depending on which track the nurse was on (medical surgical;	- Pre and post (1 year, 2 year) - Turnover decreased by 7.8% (1 year) and 9.3% (2 years) - Confidence and competence improved	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.

		88% women; 92% white; aged 20-55 years M = 29.9; 85% had some previous health care experience. 27.3% had previous experience in the hospital.	- paediatrics/paediatric critical care; adult critical care; neonatal intensive care) - The medical surgical track nurses were given 82 hours of lectures, hands on skills stations and self-directed learning exercises, 40 hours in a simulator, 358 hours with a preceptor. - There was some overlap in the tracks, nurse residents in critical care participated in all medical-surgical curriculum, but received additional lectures and simulations about critical care.	Nurses reported enjoying the programme	
Berube et al., 2012, Canada	9.	Quasi-experimental			
	4.	Newly graduated nurses	- Critical care nursing residency programme 12 months	Pre (June 2005-March 2008; 3-year average) and post (June 2008-March 2011; 3 year average)	(S) Clear cause and effect
	5.	67 participants completed intervention	500 hours of supervised clinical practice with preceptor 100 hours directed learning and 200 hours of courses and clinical simulators	30% improvement in retention - Nurses found the programme useful	(L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how retention was measured.
	6.	Quasi-experimental	Nurses assessed using oral exams, clinical exams and written tests		
Friday, et al., 2015, USA	1.	Newly graduated nurses (Aged 21-49, M = 28.72; 80.4% female; 85% White; 21.7% speciality in paediatrics; 25% speciality	- Residency and externship 12 months - Assigned a preceptor for 10-16 weeks - Given 85 hours of classroom and simulation learning	- Externship and internship vs just internship - Externship and internship had a 4% decrease of retention at 1 year and 14% decrease at 2 years - No difference between those who did the externship and those who did not on any of the Casey-Fink survey domains	(S) Clear cause and effect (L) Not clear if control and intervention nurses are similar enough to make comparisons; not explicitly stated how retention was measured.

		in adult critical care)			
	2.	60			
	3.	Quasi-experimental			
Halfer, 2007, USA	1.	Newly graduated nurses	• Internship • 1 year • Assigned both a mentor (from a different ward) and a preceptor (16-36 weeks)	• Pre (2002) to post (12 months after intervention) • 17.2% decrease in turnover • Nursing satisfaction increased	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how turnover was measured.
	2.	296 nurses			
	3.	Quasi-experimental	• 80 hours classroom learning • Nurses are provided with verbal and written feedback • 5 separate tracks: medical-surgical; resource team; intensive care; emergency department; operating room		
Halfer, et al., 2008, USA	1.	Newly graduated nurses working inpatient medical and surgical services, neonatal and paediatric intensive care and emergency services	• Nursing internship • Assigned a mentor	• Pre (2001-2002) to post (2003-2005) • 8% decrease in turnover • Nursing satisfaction increased	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how turnover was measured.
	2.	212 nurses			
	3.	Quasi-experimental			

Harrison and Ledbetter, 2014, USA	1. Newly licensed nurses (Age M = 27.76; Gender 83% female; 87% white; 67% BSc)	• Nurse Residency Programme • 12 months • Assigned a mentor for 12 months • 8 hours of classroom learning on leadership, 4 hours on patient safety •	• Three hospitals: Site A (intervention); Site B & C (control) • Site A had a 2% increased turnover at 1 year compared to the control sites. • No significant differences between sites in terms of answers on a skills questionnaire	(S) Clear cause and effect; participant characteristics were reported (L) Not explicitly stated how turnover was measured, and turnover may have been measured differently by different hospitals.
	2. 46 nurses (intervention group)			
	3. Quasi-experimental			
Keahey, 2008, USA	1. Newly graduated nurses	• Nurse Residency • 9 months, but most completed in 6 • Assigned a preceptor	• Pre and post (2 years after intervention) • 40% increase in retention	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how retention was measured.
	2. 5 nurses	• 10 weeks clinical nursing with preceptor, 12 weeks leading patient care with preceptor, 4 weeks assuming full patient care with preceptor available as back up, 4 weeks night shift with preceptor as backup.		
	3. Quasi-experimental	• 3 days at neonatal intensive care unit • 8 days classroom learning		
Newhouse, et al., 2007, USA	1. Newly graduated nurses	• Social and Professional Reality Integration for Nurse Graduates (SPRING): Internship programme	• Comparison group vs Intervention (SPRING) • 8% improvement in retention at 18 months post intervention	(S) Clear cause and effect; authors explain how retention was measured
	2. NR	• 12 months	• 12% improvement in retention at 24 months	(L) Not clear if control and intervention group are similar enough to make comparisons
	3. Quasi-experimental	• Assigned a preceptor • Nurses attend 10 education seminars •	• Less likely to consider leaving their position	

Olson-Sitki, et al., 2012, USA	1. Newly graduated nurses 2. 79 nurses 3. Quasi-experimental design	• Nurse Residency Programme • Central nursing orientation week-long educational immersion • Individual unit-based clinical and professional orientation where a preceptor is assigned (3 months) • Nurse residency development days (monthly) • 37 hours classroom training • Progress of nurses assessed weekly	• Pre (1-2 years before) to post (1-2 years after) • 1 year pre to 1 year post, 5% decrease in turnover • 2 years pre to 1 year post, 8% decrease in turnover • 2 years pre to 2 years post, 4% decrease in turnover • Nurses felt more confident	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how retention was measured.
Pine and Tart, 2007, USA	1. Newly graduated nurses 2. NR 3. Quasi-experimental design	• The Methodist Hospital's UHC baccalaureate Nurse Residency Programme • 12 months • General orientation • Unit-based orientation with a preceptor for 6 weeks to 6 months depending on the nurse • Learning sessions, 8-16 hours per week; 4-8 hour seminars per month	• Pre (2003) to post (2005) • 37% decrease in turnover	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how turnover was measured.
Trepanier, et al., 2012, USA	1. Newly graduated nurses (87% female; the 52% aged between 23 and 30 years of age; 58% White; 54% held a baccalaureate degree as the highest level of nursing education)	• Nurse Residency • Classroom learning • Unit-based learning • Looping • Mentoring • Self-care debriefing sessions	• Data averaged across 15 hospitals • Pre (12 months) to post (12 months) • 29.63% mean decrease in turnover • The nurse residency led to \$10-50 savings per patient day	(S) Clear cause and effect; authors explained how turnover was measured (L) Not clear if pre and post are similar enough to make comparisons.

Trice, et al., 2007, USA	2.	524 nurses			
	3.	Quasi-experimental			
	1.	Nurses with no perioperative internship	• Externship (12 weeks) then perioperative internship programme (9 months) • Assigned a preceptor for 12 weeks	• Pre (2 years) to post • 21% improvement in retention	(S) Clear cause and effect (L) Not clear if pre and post are similar enough to make comparisons; not explicitly stated how retention was measured.
	2.	100 did externship, 38 of these were hired into the internship	• Classroom learning • Weekly tests		
Ulrich et al., 2010, USA	3.	Quasi-experimental			
	1.	Newly graduated nurses (58% had Baccalaureate, 58% aged between 23-30 years)	• Versant Residency Programme • 1 year • Assigned a preceptor (18 weeks) and a mentor • 225 hours of classroom time • Debriefing sessions • Preceptors evaluate nurses' competency and nurses carry out self-assessments	• Pre (however, the authors state there was no standardised way of measuring turnover before the intervention) to post (cumulative, 10 years of data) • 19.9% decrease in turnover at 12 months post recruitment • 29.4% decrease in turnover at 24 months post recruitment • Increase confidence and competency	(S) Clear cause and effect; participant characteristics were reported (L) Not explicitly stated how turnover was measured and authors state that pre-intervention turnover data did not have a standardised measuring system
	2.	6000+ (over 10 years of data)			
Williams, et al., 2002, USA	3.	Quasi-experimental			
	1.	New hires	• Nurse Residency Programme	• Nine hospital units took part in the intervention	(S) Clear cause and effect (L) Not clear if intervention and control group are similar enough to make comparisons; not explicitly stated how turnover was measured. No numbers were provided, only percentage change.
	2.	93 nurses	• 6 months	• The authors report a percentage change for each unit 1 year after the intervention (For intervention group: M = 9.31; for non-intervention group: M = -14.54)	
	3.	Quasi-experimental	• Assigned a preceptor (30 weeks) and a mentor (30 weeks) • Classroom learning		

-
- Therefore, the intervention group led to a decrease in turnover
 - Nurses reported being satisfied with the model
-

KEY: * based on Joanna Briggs quality appraisal; NR = not reported

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Table S4: Orientation and Transition to Practice (n = 15)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Blegen, et al, 2015, USA	1. Newly licensed nurses, 82 hospitals split into low preceptor support and high preceptor support 2. 82 hospitals; 405 nurses exposed to high preceptor support 3. Randomised controlled trial	• Transition to practice • 6 months • Assigned a preceptor, but preceptor support varied across hospitals • Participants complete 5 online learning modules • Nurses assessed by preceptors on their competence	• There was a 6% increase in retention in interventions with high levels of preceptor support compared to interventions with low levels of preceptor support. • Nurses in the high levels of preceptor support hospitals rated the experience more positively	(S) Hospitals randomly assigned to the Transition to Practice Programme; Large numbers of participants (L) Not clear whether the intervention itself had an impact, or whether it was just the level of preceptor support
Bullock, et al., 2011, USA	10. Newly graduated nurses 11. 128 nurses 12. Quasi-experimental	• Orientation programme • 12 months • Assigned a preceptor for 40 hours one-on-one, but support continued throughout the programme	• Pre (2007) to post (2009) • Turnover for newly graduated nurses decreased by 31.1%	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Faron and Poeltler, 2007, USA	10. Registered Nurses, 57 out of the 87 were new graduates	• Orientation programme • 12 months • Assigned a mentor, who has the same speciality as them. They	• Pre (July 2003-June 2004) to post (October 2004 – July 2005) • 13% decrease in turnover	(S) Clear cause and effect, turnover data was taken from HR department (L) However, an algorithm used to calculate turnover was not

Friedman, Delaney, et al., 2011, USA	11. 87 nurses	meet with the mentor monthly for one hour	• The orientation led to a \$328,000 annual saving	provided; not clear if pre and post nurses are similar enough to make comparisons
	12. Quasi-experimental	• 8 hours of classroom learning • Every quarter the nurses have a four hour orientation, follow by a 2 hour educational support programme. • Nurses are paid to attend orientation and meetings		
	10. Newly graduated nurses; Intervention assessed in two stages (2005-2007) and (2007-2010). 1) 2005-2007 nurses: N = 28; 27 females; 19 white; age M = 33.2. 2) 2007-2010 group: N = 49; 46 females; 43 white; age M = 28.4	• Paediatric nurse fellowship orientation programme • Nurses assigned a mentor (10 weeks) and a preceptor (17 weeks) • 370 hours of learning (seminars, classroom and clinical simulator) • Nurses and leaders have regular meetings to assess comprehensive knowledge acquisition, skill mastery and critical thinking of the newly graduate nurses. •	• Control group: 2005-2006 2 week classroom training, and 2-6 months preceptor support. In 2006 additional ICU content was added vs Intervention group (Paediatric Nurse Fellowship group) • 12% improvement in retention for all paediatric nurses	(S) Clear cause and effect; both control and intervention group characteristics were reported and there were no statistically significant differences between groups; retention was obtained via hospital records, (W) but no algorithm was provided of how it was calculated.
Friedman, et al., 2011, USA	11. 49			
	12. Quasi-experimental			
Friedman, et al., 2011, USA	7. Newly graduated nurses. Comparison	• Critical care fellowship • 12 month orientation • Nurses are required to work 2 years at the hospital	• Control group (standard orientation) vs intervention group (Critical Care Fellowship)	(S) Clear cause and effect; both control and intervention group characteristics were reported and there were no statistically

	group: (n = 30): age M = 33, 24 female; 15 white. Intervention: (n = 60). Age M = 29.7; 54 females; 36 white. No sig differences	- Assigned a mentor (9 weeks) and preceptor (16 weeks) 333 hours of classroom and seminar learning	Retention improved by 20%	significant differences between groups; retention was obtained via hospital records, (W) but no algorithm was provided of how it was calculated.
Hillman and Foster, 2011, USA	8. 60 nurses 9. Quasi-experimental 1. Newly graduated nurses 2. 251 nurses 3. Quasi-experimental	- Nursing transitions programme 16 weeks - Assigned a preceptor - Classroom and clinical simulator learning	- Pre (1 year before intervention) to post (5 years after adoption of intervention) - Retention increased by 22.5%	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how retention was measured.
Kozub, et al., 2015, USA	4. Registered nurses (Most nurses hired (64.3%) were experienced, non-ICU nurses. There were 6 new graduates (14.3%) and 9 experienced ICU nurses (21.4%). Nurse experience (excluding	- Orientation Programme - Variable length depending on the needs of the nurse. Experienced nurses with no ICU experience: 11-12 weeks; experienced ICU nurses: 6-8 weeks; new graduates: 14-16 weeks - Made up of three phases: Phase 1: basic ICU skills and safety practices; Phase 2: intermediate skills and time management; Phase 3: complex patient conditions - Assigned a matched preceptor based on processing of information style	- Pre (previous 2-year retention) to post (current 2-year retention) - Retention improved by 20%	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how retention was measured.

		new graduates) ranged from 2 to 7 years)	- Completed 39 online learning modules - Nurses completed the following assessments: Electrocardiogram rhythm examination; ICU BKAT Test; assessed on various competencies; emergency standing order examination; mock cardiac arrest scenario		
	5.	42 nurses			
	6.	Quasi-experimental			
Marcum and West, 2004, USA	4.	Newly graduated nurses from 3 hospitals	- New graduate orientation programme 6 months 13 weeks in a practice unit, followed by 3 weeks in the unit the nurse would be working.	- Pre and post (18 months after intervention) 11% decrease turnover - Improvement in nurses critical thinking and interpersonal skills after 8 weeks	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
	5.	20 nurses			
	6.	Quasi-experimental	- Nurses assigned a preceptor for whole 6 months - Nurses have weekly classroom instruction, and are given pre-assignment tasks such as reading before going to view certain procedures - Nurses assessed on competencies - Preceptors given \$600 bonus for each 13-week segment of the programme they participated in		
Morphet, et al., 2008, Australia	1.	New hires (84.6% female, 55.8% aged 26-30; 51.9% had one year post-registration nursing experience)	- The Career Development Year - Structured orientation - Targets registered nurses with little or no emergency nursing experience 74 hours structured learning	- Intervention vs control (those not completing the CDY) - Short term retention (12 months) increased by 37% - Long term retention (nurses who stayed in emergency nursing, regardless of location) increased by 49.7% - Participants felt the programme prepared them	(S) Clear cause and effect (L) Not clear if control and intervention nurses are similar enough to make comparisons; not explicitly stated how retention was measured.

Morris et al., 2009, USA	2.	72 nurses			for a career in emergency nursing	
	3.	Quasi-experimental				
	4.	New hires (Eighty-seven percent of the new hires (n = 171) were female; 79% White; the mean age at hire was 28 years; 109 nurses had less than 1 year previous experience	• Orientation programme • Assigned a preceptor • Nurses completed online courses, case studies, clinical simulator and bedside learning • Assessed using the BKAT	• Pre (May 2005) to post (August 2006) • Retention improvement by 1.9% • Turnover decreased by 2.48% • Programme led to an increase in monthly hire rates • Nurses found the programme satisfactory	(S) Clear cause and effect; information provided about intervention group (L) However, no information about control group so not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.	
	5.	171 nurses				
	6.	Quasi-experimental				
Orsini, 2005, USA	4.	Newly graduated nurses (Aged 24-42. 2 had a BSN degree, one an ASN degree)	• Orthopaedic Nurse Transition Programme • 12 weeks • Assigned a preceptor for 12 weeks • Set up the follow ways: Week 1: house wide orientation/meet with preceptor; Week 2: prerequisite education; Week 3: unit/clinical interventions; Week 4: unit/clinical processes; Week5: integration of weeks 3 & 4; Week 6-12: individual patient assignments • Classroom and hands-on learning (48 hours) • Assessed using the NCLEX-RN	• Intervention vs Comparison (whole hospital) • Intervention group had 14.9% reduced turnover • Improved quality of care, patient satisfaction and staff satisfaction	(S) Clear cause and effect; (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured; only 3 nurses did the intervention	
	5.	3 nurses				
	6.	Pilot				

Schoessler and Waldo, 2006, USA	1. Newly graduated nurses 2. NR 7. Quasi-experimental	• Orientation programme • 2-year long programme • First 5 weeks nurses are assigned a preceptor • Classes take place at 1 month, 3 month, 6 months, 9 months and 12 months • At 18 months nurses learn about becoming leaders • At 24 months nurses have their final class	• Pre (1998) to post (2003) • Turnover decreased by 28%	(S) Clear cause and effect; authors explained how turnover was measured (L) Not clear if control and intervention nurses are similar enough to make comparisons.
Scott and Smith, 2008, USA	4. Newly graduated nurses 5. NR 6. Quasi-experimental	• Successful Transition and Retention (STAR Programme) • 12 months • Three phases: Phase 1: general orientation, and a pizza party for fun; Phase 2: unit based orientation; Phase 3: nurses train to become preceptors, nurses graduate • Assigned a mentor (for personal relationship) and a preceptor (for technical support) • 135 hours of classroom and skills training lab • Quarterly meet and greet for new nurses and mentors	• Pre (2002) to post (2005) • 10.7% decrease in turnover • Nurses satisfied with programme • Nurses felt more confident • 62% of nurses intended to stay in their current position	(S) Clear cause and effect; explanation of how turnover was measured was provided (L) Not clear if pre and post nurses are similar enough to make comparisons.
Shermont and Krepcio, 2006, USA	4. New hires from 3 surgical nursing units 5. 70 nurses 6. Quasi-experimental	• Orientation programme • Variable length depending on the need of the nurse • Nurses assigned a matched preceptor • Classroom learning • Weekly meetings with other new nurses and with preceptor	• Pre (2001/2002) to post (2002/2004) • 50% reduction in turnover • Increase in nurse's satisfaction	(S) Clear cause and effect; (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured; only 3 nurses did the intervention

Silvestre et al. 2017	1. Newly graduated nurses hired in 70 hospitals across USA 2. 1032 nurses 3. Comparison study using randomized, controlled multi-site design	• Transition to practice programme • 6 months in duration • Nurses assigned a preceptor • In-person and web-based learning • 20 hours of contact with preceptor and learning time	• Intervention group turnover rate 15.5%, control group turnover rate 26.8% • Net cost saving of \$7,625 per newly graduated nurse retained	(S) Clear cause and effect; large, multi-site study; clear description of cost calculations; (L) not explicitly stated how turnover was measured;

KEY: * based on Joanna Briggs quality appraisal; NR = not reported

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Table S5: Clinical ladder or advancement programmes (n = 2)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Allen, et al., 2010, USA	4. All nurses (Average participant was a 42-year old woman who had been an RN for 17 years and employed at the hospital for 11 years) 5. 1,499 nurses 6. Quasi-experimental	- Clinical advancement programme - Variable length depending on nurses needs - Nurses are assessed against clearly laid out criteria at each level - Nurses are offered a financial reward ladder depending on which stage of the programme they are on	- Intervention vs Control (peers who did not complete the programme) - Turnover was 9.4% less for the intervention group - There was an increase in organisational commitment and job satisfaction	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Drenkard and Swartwout, 2005, USA	13. All nurses (56.3% were from specialist areas of the emergency department, operating room, labour and delivery, post anaesthesia and adult critical care) 14. 2,400 nurses eligible to participate	- Clinical ladder programme - Variable length depending on nurses needs - Nurses are assessed on their clinical competencies by a nurse and a manager - Nurses receive a 6% pay rise with each increase up the ladder	- Pre intervention to post intervention: turnover decreased by 10.8% - Clinical ladder (intervention) vs whole hospital (control): turnover was 8.9% less for those on the clinical ladder programme - Nurses satisfaction increased from pre to post intervention	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.

15. Quasi-
experimental

KEY: * based on Joanna Briggs quality appraisal; NR = not reported

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Table S6: Other (n = 10)

Authors, Year, Origin	1.Population 2.Sample size 3.Design	Characteristics of intervention	Findings & important considerations	Strengths (S) & Limitations (L)*
Bonczek, et al., 2016, USA	7. New hires 8. 89 nurses 9. Quasi-experimental	- Holistic approach workshop 4 weeks 4 weekly sessions, 90 minutes each. - Session 1) concept of self-care, nutrition, exercise, sleep, relaxation; 2) coping, time management, problem solving, communication; 3) setting healthy boundaries at work; 4) work life at the medical centre including promotion, career ladder, certification, education benefits.	- Pre (one year prior to the study) to post (during the study period) - Retention increased by 1.5% 79% found the workshop somewhat/a lot/ very helpful in helping them transition into their new role	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
Cantrell and Brown, 2006, USA	1. Newly graduated nurses, (n = 26; 25 female; 1.54 years of practice; 21 had bachelors degree) 2. 193 nurses completed externship 3. Quasi-experimental	- Externship 10 weeks - Not assigned a preceptor or mentor	- Of the 193 nurses who completed the externship, 153 accepted a graduate nurse position at the institution - Intervention group vs Control group (graduate nurses who did not do an externship; 1998-2003) - Average turnover from 1998 to 2003 for externs was 22.83 - Average turnover from 1998 to 2003 for graduate nurses who did not do the externship was 14% - The intervention group had an increased turnover of 8.83%	(S) Clear cause and effect (L) Not clear if control and intervention nurses are similar enough to make comparisons; not explicitly stated how turnover was measured.
DiMeglio et al., 2005, USA	1. All nurses (Age M = 37; years registered as	- Team building intervention - Voluntary - Three sessions: Session 1: discussion of how well the team	- Pre (April 2002-September 2002) to post (October 2003-March 2004) - Turnover decreased by 3%	(S) Clear cause and effect (L) Not clear if control and intervention nurses are similar enough to make comparisons;

		a nurse M = 11; years employed on unit M = 5)	are currently working together, describing what it is like to work on the unit. Session 2: personality characteristics discussed, ways of dealing with different personality types. Session 3: identification of any issues, and action plan for resolution	Nursing satisfaction was higher in the hospital the intervention took place in, compared to the national average	not explicitly stated how turnover was measured.
	2. 165 3. Quasi-experimental				
Gokenbach, 2004, USA	1. All nurses 2. NR 3. Quasi-experimental	- Empowerment model - Monthly, 4-hour focus groups to discuss any issues nurses may be having and discuss solutions	- Pre intervention: 2.96 nurses leaving per month - Post intervention: 1.64 nurses leaving per month - Mean difference 0.132	(S) Clear cause and effect (L) Not clear if pre and post nurses are similar enough to make comparisons; a control group was discussed but no clear if there was a difference in turnover between groups..	
Hinson and Spatz, 2011, USA	16. All nurses 17. NR 18. Quasi-experimental	- Retention collaborative - Fortnightly, 30-45 minute onboarding (welcome letters, unit t-shirts, emails, welcome breakfast, “Who am I?” board, support groups) sessions - Monthly rounding (monthly meet ups with new and old staff to discuss meet up with new and old staff to discuss what employees need) - Ongoing social networking to improve team cohesion: examples include baseball, wine and cheese nights, summer pool	- Pre (2007-2008) to post (July 2008 – June 2009) 13.36 reduction in turnover from 2007 to post intervention 7.69% reduction in turnover from 2008 to post intervention	(S) Clear cause and effect; turnover algorithm provided (L) Not clear if pre and post nurses are similar enough to make comparisons.	
Kooker and Kamikawa, 2011, USA	1. All nurses 2. NR 3. Quasi-experimental	- New Nurse Fellowship 24 weeks of personal, cultural, team and leadership development	- Pre (2005) to post (2009) - Retention increased by 12.23% - Decrease in adverse patient outcomes (ulcers)	(S) Clear cause and effect (L) Not clear if control and intervention nurses are similar enough to make comparisons;	

Meraviglia et al., 2008, USA	1. All nurses (88% were women; mean age of 45.8; 84.3% white; 83% registered nurses; 44.2% had an associate degree) 2. 1150 nurses 3. Quasi-experimental	• Tours of cultural, sacred and historical sites and story telling • Nurse-Friendly hospital project • 12 hospitals were involved • Hospitals had to meet 12 criteria to be seen as "Nurse Friendly": 1) activities structure to facilitate nursing standard of care; 2) facility demonstrates concern for health and safety of nurses; 3) systems exist to address patient care concerns; 4) orientation programme is competency based and considers the education, experience and strengths and weaknesses of the nurses; 5) activities of chief nursing officer are supported by hospital administration; 6) professional development programme exists; 7) competitive wages; 8) nurses recognised for merit and excellence; 9) facility recognises the need of nurses to have a work/life balance; 10) zero tolerance for nurse abuse; 11) facilitation of leadership competency among direct-care supervisors and middle management occurs via delineated leadership programme. 12) commitment to evidence base practice.	• Pre (2004) to post (2006) • Turnover decreased by 2.72%	not explicitly stated how retention was measured. (S) Clear cause and effect; authors explained how turnover was measured (L) Not clear if control and intervention nurses are similar enough to make comparisons.
Porter and Kolcaba, 2010, USA	1. All nurses (89.8% female;	• Nursing Labor Management Partnership Intervention	• Pre (2005) to post (2008) • 3.1% decrease in turnover	(S) Clear cause and effect; authors explained how turnover was measured;

		39.35% Asian; 16.3% aged between 46-50 years) 2. 1,856 nurses 3. Quasi-experimental	• There were 5 stages to this intervention: • (a) perceived need or goal (may be identified by either partner but must then become a shared goal or mutually identified need), (b) assessment of risk or benefits (this process requires involvement of both partners), (c) decision to assume risk (requires shared commitment), (d) relationship based on positive outcomes (these outcomes provide incentives to move forward in the partnership), and (e) mutual performance expectations are met	• Nurses also had higher job satisfaction and were less likely to terminate their positions.	authors provided sample demographics for both pre and post nurses and they were similar.
Rickard et al., 2012, Australia	1. All nurses (2 hospitals). Hospital 1: 87% female; Mean age = 41.5. Hospital 2: 92% female, Mean age = 41. 2. 484 nurses 3. Quasi-experimental	• Workload intervention • The intervention involved assessing workload, increasing nursing positions, changing recruitment strategy, increasing staff, expanding the graduate programme, increasing access to continuing professional development. • Started in 2005 but was not complete until 2010	• Pre (2004) to post (2010) • Hospital 1: turnover decreased by 17% • Hospital 2: turnover decreased by 15% • There was a reduction in psychological distress and emotional exhaustion • Improvement in job satisfaction	(S) Clear cause and effect; authors explained how turnover was measured; authors provided sample demographics for both pre and post nurses and they were similar.	
Wright et al. 2017, USA	1. All (3000+) nurses in 4 urban hospitals (A,B,C,D) in one	• Electronic self-scheduling program • The intervention allowed nurses to select their work schedule during a 6 week period within hospital guidelines and could also access schedules off-site.	• Pre (2012) to post (2015) • Hospital A: turnover increased by 1.5% • Hospital B: turnover decreased by 5.3% • Hospital C: turnover decreased by 5.4%	(S) Large, multisite study; (L) Unclear cause and effect due to other changes in the hospital system; not clear if sites are similar enough to make comparisons; not stated how turnover is calculated.	

	healthcare system	Schedules were in 6 week blocks posted 6 weeks prior to the first day of the schedule	Hospital D: turnover increased by 1.4%
2.	1492 nurses		
3.	Quasi experimental	Implemented in July 2014 and ongoing during the study	Increase in perceived nurse autonomy and professional development

KEY: * based on Joanna Briggs quality appraisal; NR = not reported

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Supplementary table 7: Example of Search in CINAHL

Friday, March 24, 2017 9:09:50 AM

0				
#	Query	Limiters/Expanders	Last Run Via	Results
S10	S8 AND S9	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	5,112
S9	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	7,584
S8	MW nurs* OR MW midwife OR MW midwives OR MW RN OR AB nurs* OR AB midwife OR AB midwives OR AB RN	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	309,083

		Search modes - Boolean/Phrase		
S7	AB nurs* N5 attrition OR AB nurs* N5 leav* OR AB nurs* N5 turnover OR AB nurs* N5 quit OR MW nurs* attrition OR MW nurs* leav* OR MW nurs* turnover OR MW nurs* quit	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	1,017
S6	AB workforce N5 attrition OR AB workforce N5 leav* OR AB workforce N5 turnover OR AB workforce N5 quit	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	99
S5	AB staff N5 attrition OR AB staff N5 leav* OR AB staff N5 turnover OR AB staff N5 quit OR AB personnel N5 attrition OR AB personnel N5	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	731

	leav* OR AB personnel N5 turnover OR AB personnel N5 quit OR AB employee N5 attrition OR AB employee N5 leav* OR AB employee N5 turnover OR AB employee N5 quit	Search modes - Boolean/Phrase		
S4	MW staff attrition OR MW staff leav* OR MW staff turnover OR MW personnel attrition OR MW personnel leav* OR MW personnel turnover OR MW employee attrition OR MW employee leav* OR MW employee turnover OR MW workforce attrition OR MW workforce leav* OR MW workforce turnover	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	2,306
S3	MW nurs* retain* OR MW nurs* retention OR	Limiters - Published Date: 20010101-	Interface - EBSCOhost Research Databases	1,356

	MW nurs* loyalty OR AB nurs* N5 retain* OR AB nurs* N5 retention OR AB nurs* N5 loyalty	20170331; English Language; Peer Reviewed Search modes - Boolean/Phrase	Search Screen - Advanced Search Database - CINAHL Plus with Full Text	
S2	AB staff N5 retain* OR AB staff N5 retention OR AB staff N5 loyalty OR AB personnel N5 retain* OR AB personnel N5 retention OR AB personnel N5 loyalty OR AB employee N5 retain* OR AB employee N5 retention OR AB employee N5 loyalty OR AB workforce N5 retain* OR AB workforce N5 retention OR AB workforce N5 loyalty	Limiters - Published Date: 20010101- 20170331; English Language; Peer Reviewed Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	900
S1	MW staff retain* OR MW staff retention OR MW staff loyalty OR MW personnel retention OR	Limiters - Published Date: 20010101- 20170331; English Language; Peer	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	3,558

	MW personnel retain* OR MW personnell loyalty OR MW employee retain* OR MW employee retention OR MW employee loyalty OR MW workforce retain* OR MW workforce retention OR MW workforce loyalty	Reviewed Search modes - Boolean/Phrase	Database - CINAHL Plus with Full Text		

2.4 Repeat searches 2021

To ensure currency at the point of writing this thesis, the literature searches were repeated in March 2021, searching the same databases for new literature that met the inclusion criteria for the original searches for the systematic review. As previously, studies were included in the review if they reported primary research on interventions designed to reduce the attrition or increase retention of the nursing workforce, with data on attrition/retention/turnover rates reported on at least two occasions (e.g. pre-post data, time series design, RCT, equivalent or non-equivalent control) for comparison. Limits were imposed around date of publication to include papers from April 2018 until March 2021.

A total of 2178 records were identified through database searching with 1240 screened against the inclusion and exclusion criteria for eligibility, after duplicates were removed. Of these papers, 1177 were excluded leaving 64 papers, which were assessed for eligibility. After papers were excluded due to missing or inappropriate data, or lack of relevant intervention, 3 papers met the search criteria and were reviewed. Study selection was conducted by JB independently, consulting with LA and DS where appropriate. The PRISMA diagram of the repeat searches is illustrated in Figure 2.

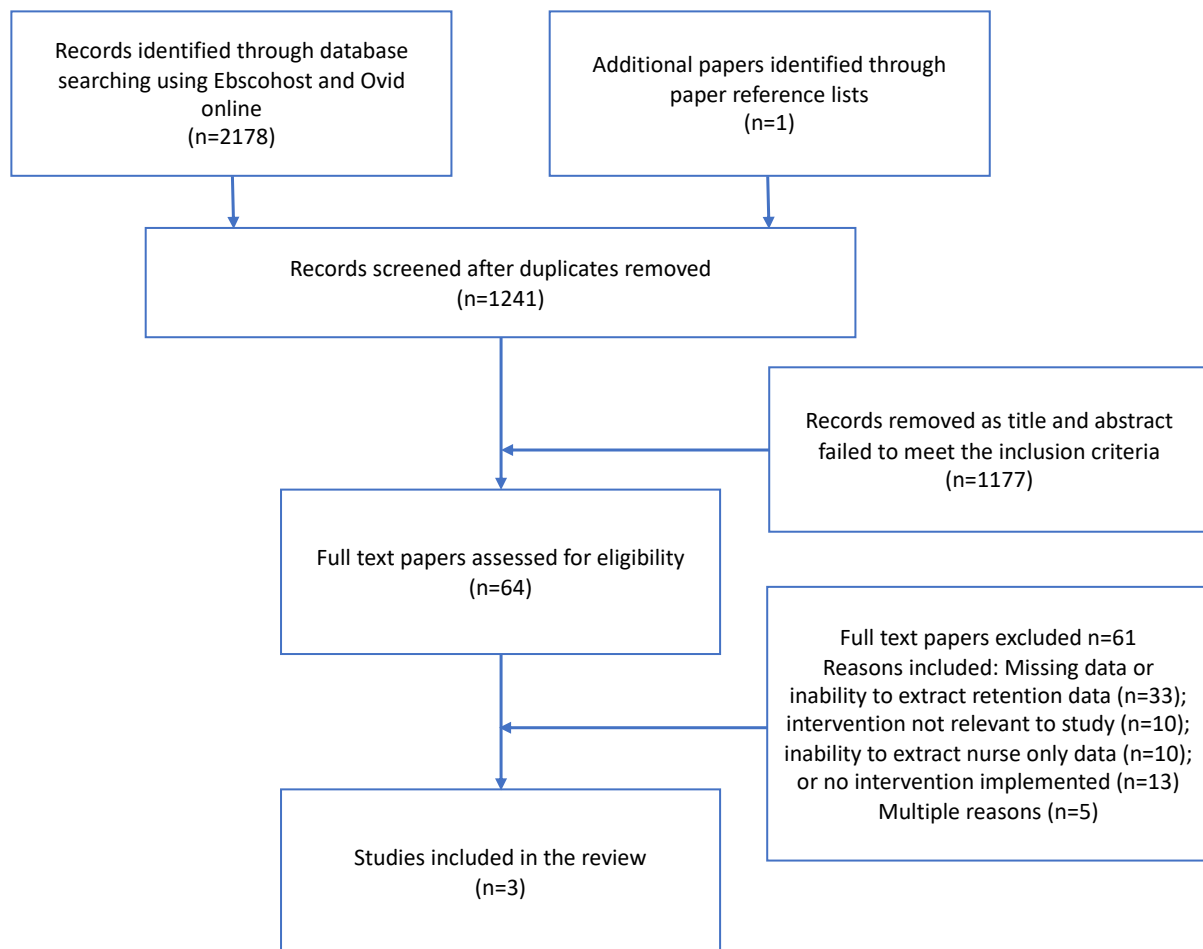


Figure 2 PRISMA Flow diagram of repeat literature search April 2018 – March 2021

(Moher, et al., 2009)

Three additional studies (Zhang, et al., 2019; Kester, et al., 2020; Brooks, et al., 2021) were included in the review and quality appraised using the Joanna Briggs Institute checklist for quasi-experimental studies. Zhang, et al., (2019) scored 9 out of 9, Kester, et al., (2020) scored 8 out of 9 and Brooks, et al., (2021) scored 5 out of 9 potential points on the checklist. Relevant data were extracted from the papers and are presented in Table 7.

Zhang, et al., described a 12-month long mentorship programme, implemented with 329 nurses, with follow-up over a 3-year period. Newly qualified nurses were assigned a mentor, who also acted as a preceptor during the first year following qualification. The control group were assigned to the standard preceptorship programme. The intervention group demonstrated a decrease of 10% in turnover at 1 year, 6% decrease at 2 years and 6%

decrease at 3 years compared to the control group. The difference between the two groups was statistically significant at year 1 but not at years 2 or 3.

In this study early career nurses who benefitted from an individual carrying out the mentor and preceptor roles showed a lower likelihood of leaving the organisation, which aligns with findings of the main systematic review. The mentorship programme lasted 52 weeks, which again reinforces with the findings that interventions of 27-52 weeks show more success. The authors consider that key to the success of the mentorship programme was the matching of mentor and mentee against common interests and values, which resulted in a closer and more successful relationship.

Kester et al. described a 12 week 'prospective staffing' intervention that supported 388 early career nurses over a four-year period. Newly qualified nurses worked with a preceptor and received formal classroom and bedside teaching, and regular assessment. The intervention was designed to support orientation to a cardiothoracic unit in America and demonstrated a 17.6% decrease in turnover, over a 4-year period.

In this recent study a positive effect on turnover and length of tenure was reported, reinforcing the earlier systematic review conclusions that support by a preceptor and teaching are important characteristics of successful interventions to support early career nurse retention. The intervention, described by the authors as a prospective staffing model, was most closely aligned to an orientation to practice programme and as such fitted with findings that such programmes often have a positive effect on turnover or retention. The intervention reported was conducted over 12 weeks, which was shorter than the 26–52-week interventions that were most associated with success in the main systematic review.

Brooks, et al. describe an intervention to increase retention of newly qualified nurses whose first post was in the perioperative environment. Individuals who were interested in working in the perioperative area once qualified were identified as students and offered an elective placement in the operating room prior to qualification. Retention of these nurses was measured at 6- and 18-months post-employment as perioperative nurses, after undertaking the standard orientation to operating room practice programme as new employees.

Comparisons were made with a control group of nurses who had undertaken only the standard orientation programme. Results indicated a 17% increase in retention for the intervention group compared to the control group at 18 months.

During the intervention, students were offered enhanced online and face-to-face teaching and the support of a preceptor for 125 hours, reinforcing the positive relationship between a preceptor and teaching and early career nurse retention. The intervention was most closely aligned to an orientation to practice programme and as such concurred with findings of the systematic review that such programmes often have a positive effect on retention. The duration of the intervention was not clear, but it was reported to consist of 150 hours of teaching and preceptorship. It is likely that it was shorter than the 26–52-week interventions that were most associated with success in the main systematic review. Detail of the three papers is provided in Table 7.

Table 7 Turnover and retention data summary for additional papers

Author, Year & Country	Design	Sample Size for retention /turnover	Quality Score	Intervention	Duration of intervention	Main Findings in relation to retention and turnover
Zhang, et al., 2019 China	Time series non-equivalent control group	239 nurses (intervention group) 199 (control group)	9/9	One to one mentoring model	12 months	10% decrease in turnover at 1 year, 6% decrease at 2 years and 6% decrease at 3 years.
Kester et al., 2020, USA	Time series non-equivalent control group	388 nurses	8/9	Prospective staffing model	12 weeks	Length of retention increased by 286 days and turnover decreased (17.6%) over a five-year period.
Brooks, et al., 2021 USA	Time series non-equivalent control group	24 nurses (intervention) Control group numbers not stated	5/9	Academic-clinical partnership orientation to practice programme	150 hours	17% increase in retention compared to control group at 18 months post-employment.

2.5 Additional benefits of interventions to decrease retention

When conducting the initial systematic review, observations were made about the additional benefits of the interventions that were described in the included papers, beyond that of retention of early career nurses. Although this detail was not included in the published paper, due to lack of proof of causality, it was useful to consider these benefits in the context of the design of this current study. The additional detail is described below, in connection with each of the different interventions and components. The detail is also summarised in Table 8.

Lee et al. (2009), found a non-significant trend for preceptorships to improve patient care, and Leigh et al. (2005) found preceptorship programmes improved nurses' confidence. For interventions with a preceptor component, additional advantages included improved nurse satisfaction (Almada, et al., 2004; Orsini, 2005; Shermont & Krepcio, 2006), increased nurse confidence (Beyea, et al., 2010; Leigh, et al., 2005; Olson-Sitki, et al., 2012) and competence (Beyea, et al., 2010). Furthermore, studies found an improvement in nurses' critical thinking and interpersonal skills (Marcum & West, 2004), increased organisational commitment (Newhouse, et al., 2007), improved patient satisfaction and patient care (Lee, et al., 2009; Orsini, 2005) and financial return on investment (Silvestre et al. 2017).

Mentorship programmes also led to an increase in nurse satisfaction (Mills & Mullins, 2008; Vergara, 2017); improved teamwork (Latham, et al., 2011), increased confidence and a stronger commitment to stay in the role (Vergara, 2017). Interventions with a mentor component were also associated with improved nursing satisfaction (Halfer, 2007; Halfer, et al., 2008; Mills & Mullins, 2008; Vergara, 2017) and improved teamwork (Latham, et al., 2011). Interventions that included both preceptor and mentor components were associated with increased nurse confidence (Anderson, et al., 2009; Beecroft, et al., 2001; Halfer, 2007; Halfer, et al., 2008; Scott and Smith, 2008) and competence (Scott & Smith, 2008), a more realistic view of the nursing role (Beecroft et al., 2001) and higher job satisfaction (Halfer, 2007; Halfer, et al., 2008).

Additional benefits of internships were reported as increased nurse satisfaction (Almada, et al., 2004; Halfer, 2007; Halfer, et al., 2008); increased nurse confidence, (Anderson, et al., 2009; Beecroft, et al., 2001; Beyea, et al., 2010; Olson-Sitki, et al., 2012; Ulrich, et al., 2010) a more realistic view of the nursing role (Beecroft, et al., 2001), more commitment to staying in the role (Newhouse, et al., 2007) and an improvement in nurses' competence (Ulrich, et al., 2010).

Orientation programmes were found to lead to an improvement in critical thinking and interpersonal skills (Marcum & West, 2004) and increase nurse satisfaction (Orsini, 2005; Shermont & Krepcio, 2006) improved quality of care and patient satisfaction (Orsini, 2005) and financial return on investment (Silvestre et al. 2017).

Interventions that offered speciality tracks were also associated with improved nurse confidence (Beyea, et al., 2010; Leigh, et al., 2005), competence (Beyea, et al., 2010) and job satisfaction (Halfer, 2007; Halfer, et al., 2008; Orsini, 2005; Vergara, 2017). Further, Orsini (2005) found speciality tracks increased patient satisfaction and quality of care.

Programmes that included a teaching component were associated with increased nurse satisfaction (Almada, et al., 2004; Halfer, 2007; Halfer, et al., 2008; Mills & Mullins, 2008; Orsini, 2005; Shermont & Krepcio, 2006; Vergara, 2017), improved nurse confidence (Anderson et al., 2009; Beecroft et al., 2001; Beyea et al., 2010; Leigh et al., 2005; Olson-Sitki et al., 2012; Scott & Smith, 2008; Ulrich et al., 2010), and competence (Beyea et al., 2010; Ulrich et al., 2010), and a more realistic view of the role of nursing. In addition, improved teamwork (Latham et al., 2011), increased critical thinking and interpersonal skills (Marcum & West, 2004), heightened organisational commitment (Newhouse et al., 2007; Scott & Smith, 2008) increased patient satisfaction and quality of care (Lee et al., 2009; Orsini, 2005) and financial return on investment (Silvestre et al. 2017) were identified as benefits.

Interventions that utilised both informal and formal assessment were also associated with an increase in organisational commitment (Allen, et al., 2010), improved nurse satisfaction (Allen, et al., 2010; Almada, et al., 2004; Drenkard & Swartwout, 2005; Halfer, 2007),

increased nurse confidence (Anderson, et al., 2009; Beecroft, et al., 2001; Beyea, et al., 2010; Leigh, et al., 2005; Olson-Sitki, et al., 2012; Williams, et al., 2002) and competence (Beyea, et al., 2010; Williams, et al., 2002) as well as a more realistic view of the nurses role (Beecroft, et al., 2001). Critical thinking and interpersonal skills were also found to be improved (Marcum & West, 2004), as well as increased quality of care and patient satisfaction (Orsini, 2005).

Clinical ladder programmes were associated with an increase in organisational commitment (Allen, et al., 2010) and job satisfaction (Allen, et al., 2010; Drenkard & Swartwout, 2005). Interventions that offered financial or advancement incentives were also associated with an increase in organisation commitment (Allen, et al., 2010), improved job satisfaction (Allen, et al., 2010; Drenkard & Swartwout, 2005), increased confidence (Anderson, et al., 2009), improvement in patient care and satisfaction (Lee, et al., 2009) and improvement in nurses' critical thinking and interpersonal skills (Marcum & West, 2004).

Although the noted benefits cannot be assumed to have a direct causal relationship with the intervention type or component, it is clear that implementing interventions aimed at increasing retention has the potential to have individual and organisational benefit beyond that of retaining early career nurses.

Table 8 Additional reported benefits of interventions to increase retention

Associated effect on early career nurses	Improved patient care	Increase in confidence	Increase in satisfaction	Increase in competence	Improvement in critical thinking skills	Increased organisational commitment	Financial return on investment	Improved interpersonal skills	Improved teamwork	More realistic view of role
Intervention										
Preceptorship Programmes	X	X								
Mentorship Programmes			X						X	
Residency Programmes and Internships		X	X	X		X				X
Orientation and programmes	X		X		X		X			
Specialty tracks	X	X	X	X						
Clinical Ladder or advancement programme			X			X				
Component										
Mentor			X						X	
Preceptor	X	X	X	X	X	X	X	X		
Mentor and preceptor		X	X	X						X
Teaching/training	X	X	X	X	X	X	X	X	X	X
Assessment		X	X	X		X				
Incentives	X	X	X		X	X		X		

Many of the additional benefits relate to early career nurses developing confidence, competence and job satisfaction, with consequent impact on the quality of patient care, financial return on investment and organisational commitment. Most studies reported an increase in satisfaction, and this may be linked to the conclusion reached by Edwards et al (2015) that any intervention is better than no intervention as it alters the early career nurses' perception of the organisation's commitment to their careers. However, given that increase in satisfaction is such a common outcome, it may not be the most informative measure for assessing effectiveness of an intervention. These findings related to additional benefits were influential to the design of the remaining two phases of the study.

A large body of evidence has been reviewed in the systematic review and repeat searches, offering a comprehensive overview of available literature on interventions to support retention of early career nurses, implemented during the first year after graduation. Interventions with some evidence of benefit include internship/residency programmes and orientation/transition to practice programmes, lasting between 27-52 weeks. The inclusion of a teaching and preceptor and mentor component appears to be important. These components of interventions identified as effective can be used as a foundation for developing or refining transition programmes for early career nurses so that maximum return on investment is achieved. The findings will be of interest to healthcare organisations that employ early career nurses internationally.

Additional associations between interventions to increase retention and positive individual and organisational benefit were also noted. A summary of these findings was used to form the foundation of the collaborative work with the co-production group in the next phase of the study.

2.6 Implications for development of interventions to increase retention

The literature review and systematic review have considered the types of interventions that have been implemented to increase retention and decrease turnover of early career nurses. Those interventions were implemented at two time points, either in the final year of the undergraduate education programme, or the first year following qualification as a nurse.

The reviews necessitated consideration of many papers, giving potential oversight not only to the outcomes of many interventions, but also the process of development of those interventions.

As previously discussed, the quality of the reporting was generally low, and a large proportion of the papers did not report on the development of the interventions. Although absence of reporting does not confirm that students or early career nurses were not involved, there were few papers that described their involvement in the planning, development, or implementation of the interventions. Although several papers report qualitative evaluation of an intervention, including interviews, focus groups, or reflective journals involving students, only one (Broad, et al., 2011) reports student involvement in the development or implementation. One other paper, (Callaghan, et al., 2008) describes an intervention where student autonomy to plan their learning is foremost in the delivery. Given that students or early career nurses will be in receipt of the intervention on implementation, it would seem apposite to draw on their lived experience during development and implementation. Service user involvement in development of research studies is a growing expectation from prominent UK research funding sources such as the National Institute for Health Research (NIHR, 2021).

This consideration is especially important in the context of the knowledge that in the UK, few healthcare organisations consult HEIs, and possibly therefore not students, on the development of preceptorship programmes (Health Education England, 2018), even though these are currently the mainstay of transition to practice support for students.

Recommendations from recent national documents such as the RePAIR project report (HEE, 2018), and NMC Guidelines for Preceptorship (NMC, 2020) suggest that HEIs, healthcare providers, and students, should work in partnership to review and develop programmes of support for student transition into clinical practice. To acquire a better understanding of interventions that are designed to improve retention, it would seem critical to not only incorporate the views of students, but also extend their involvement to co-design or co-production of the interventions so that their valuable lived experience is captured and incorporated into the structure of transition programmes. Involvement of students and early career nurses in the development and implementation of strategies that will ultimately

affect them, and their peers, is an empowering approach, which models the empowerment known to support the transition from student to qualified practitioner (Twigg and McCullough, 2014; Laschinger, et al., 2016).

2.7 Summary

This study aimed to develop and implement an intervention to increase retention of early career nurses. This chapter has reported on the review of a large body of evidence about interventions implemented with final year students and early career nurses to increase retention, ease transition, and decrease stress. The conclusions of the two reviews informed the development of the intervention for this study.

In addition, a gap that emerged from the literature reviews was lack of evidence of collaborative development of such interventions, despite compelling arguments for the benefit of collaborative and empowering processes to support transition and retention. Co-production, as described in the introduction chapter, is a mechanism for engaging students and early career nurses in the development of an intervention, hence, additional aims of this PhD study were:

- To explore how a group of early career nurses and student nurses use current evidence and experience to co-produce an intervention to increase retention and decrease turnover of early career nurses.
- To explore the experiences of students and early career nurses during the co-production process.
- To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process.

The process of co-production and the results of the collaboration are reported in chapter 4.

Chapter 3 Methodology and methods

This study was designed to develop an intervention to increase retention of early career nurses. The design of the intervention drew on currently available evidence and was developed by a group of student nurses and early career nurses using a co-production process. The feasibility and acceptability of co-production to develop the intervention was assessed from the perspective of students and early career nurses in the co-production group.

The overall study design and associated rationale is presented in this chapter. The theoretical framework underpinning the study, as well as details of the study setting and elements common across the phases, are outlined here. Details specific to a single phase of the study are provided in subsequent chapters. In particular, Chapter 4 focuses on phase 1 of the study, which was the development of the intervention, and Chapter 5 focuses on phase 2 of the study, which describes the implementation of the intervention. Chapter 4 and 5 provide more detail of the methods undertaken for the two phases and include published papers that present the results from each phase.

3.1 Study Design

This was a two-phase, explanatory sequential mixed methods study. Phase 1 involved the development of the intervention using a co-production process and assessment of acceptability regarding the process. Phase 2 involved the implementation of the intervention, with assessment of acceptability and feasibility. The overall design of the study is illustrated in Figure 3.

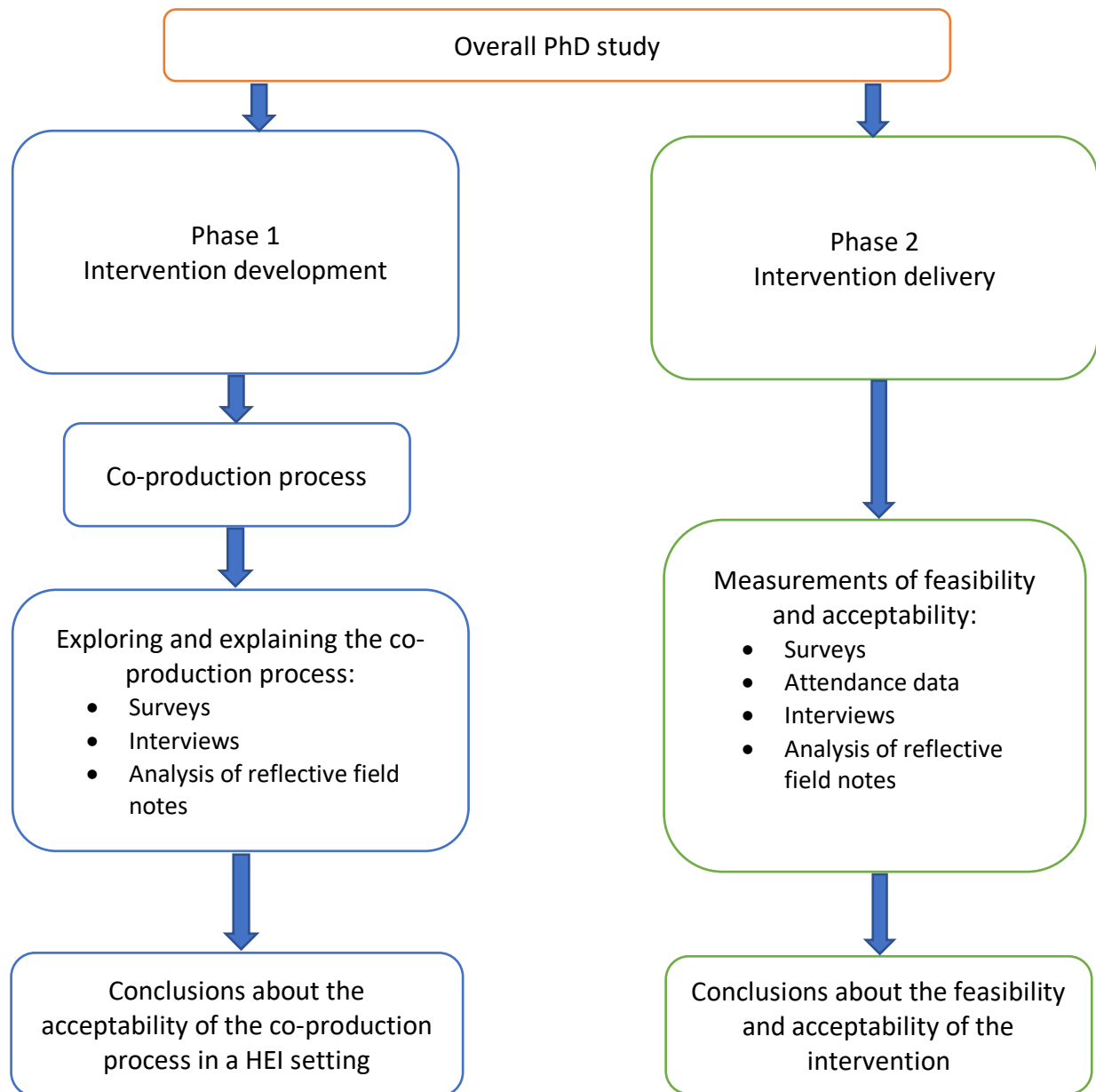


Figure 3 Diagram illustrating the overall study design

3.2 Study Design: mixed methods

Mixed methods have become an increasingly common method for conducting studies in health and social sciences studies. It involves collection and analysis of data using both quantitative and qualitative methods to answer the research question (Creswell, 2017). Much of the development of mixed methods emerged during the 1990s and successfully rendered the paradigm wars of the 1980s irrelevant (Hall, 2020).

The general rationale for using mixed methods is the added value gained by drawing on the strengths of both qualitative and quantitative methods, as each method may compensate for the weaknesses of the other (Vedel, et al., 2019). When statistical data are combined with stories and personal experiences, collectively, the data are stronger and provide a more complete understanding of the issue than either data set would on its own (Creswell and Plano Clark, 2011).

Mixed methods, however, is not without challenges and it is important that the choice to use both quantitative and qualitative methods together is driven by the research question that needs to be answered (Gelling, 2014). There should be an explicit rationale for why mixed methods are the best approach for any given study (Halcomb, 2019). Using mixed methods adds complexity to a research study, with subsequent resource implications. Generally, a larger team and more time is required to incorporate expertise in both quantitative and qualitative data collection and analysis (Larkin, et al., 2014). Bringing together researchers from two fundamentally different methodological disciplines may present logistical and philosophical challenges that demand careful management (Murphy et al., 2014; Creswell, 2017). This may manifest as doubts about the scientific rigour of each element of a study, with the perceived risk that neither approach has been conducted to a high enough quality, ultimately devaluing the credibility of the overall findings (Gelling, 2014).

In this study specifically, mixed methods were chosen to create a more comprehensive view of the development of the intervention, including the feasibility and acceptability of the co-production process. The study utilised qualitative methods to explain the quantitative data. Benefits such as triangulation and complementarity (Greene, et al., 2015), enhanced credibility and integrity of the findings, greater contextual understanding, and increased utility (Bryman, 2006), were also potentially realised by using mixed methods. This design helped to ensure that the intervention was appropriate for the study setting and added detail about the context of personal experiences. Quantitative data alone would not have adequately probed the perspectives and experiences of the participants and qualitative data would not have allowed for accurate measurement of how people felt or any generalisation to a wider population.

The advantages of using mixed methods in this study are outlined in Table 9. A mixed methods methodology was chosen since it was agreed that quantitative data were required to document the extent to which the co-production and the intervention were acceptable to participants. Qualitative data were required to understand the experiences of participants in both the co-production process and the implementation of the intervention. In addition, synthesis of the two data sets offered greater value than analysing each in isolation, offering a more comprehensive picture of the phenomena being examined, and multiple perspectives from which to contextualise and explain the findings.

Table 9 Advantages of using mixed methods research in this study

(Adapted from Hall, 2020 P14 and Greene, et al., 2015)

	Rationale and advantage of using mixed methods in this study
1.	Mixed methods allowed a wider range of research questions to be answered. The study aims and objectives included questions aligned to qualitative and quantitative methods, as well as questions that combined both types of data to answer one question. Selecting methods most appropriate for multiple inquiry expanded the scope of the research.
2.	Mixed methods utilised the strengths of different methods to offset the weaknesses that those methods may have had if used by themselves. This triangulation increased the viability of the results and allowed stronger inferences to be made by counteracting the biases inherent in methods.
3.	Using mixed methods offered the opportunity to identify any divergent findings, paradox, or contradiction by recasting the results from one method with questions from the other method. For example, exploring inconsistencies between the findings from the in-depth interviews about the acceptability of the intervention, and the quantitative attendance data. These data were analysed from the perspectives of the different methods and paradigms.
4.	The findings were integrated into the one study, which gave a more comprehensive picture of the phenomena under investigation. Mixed methods offered complementarity by seeking elaboration and enhancement of results from one method with results from another. For example, the findings from the interviews and focus groups provided context for the attendance and acceptability findings.

An explanatory sequential design was chosen, initially using quantitative methods and then qualitative methods to help explain the quantitative data. The study consisted of two phases. Phase 1 involved the development of the intervention using a co-production process and assessment of acceptability regarding the process. Phase 2 involved the implementation of the intervention, with assessment of acceptability and feasibility.

The sequential design was chosen to extend understanding of findings derived from the quantitative elements by undertaking follow-up qualitative research. This allowed new lines of inquiry to be undertaken that were not necessarily envisaged at the start of the research. The explanatory sequential design for each phase of the study is illustrated in Figure 4.

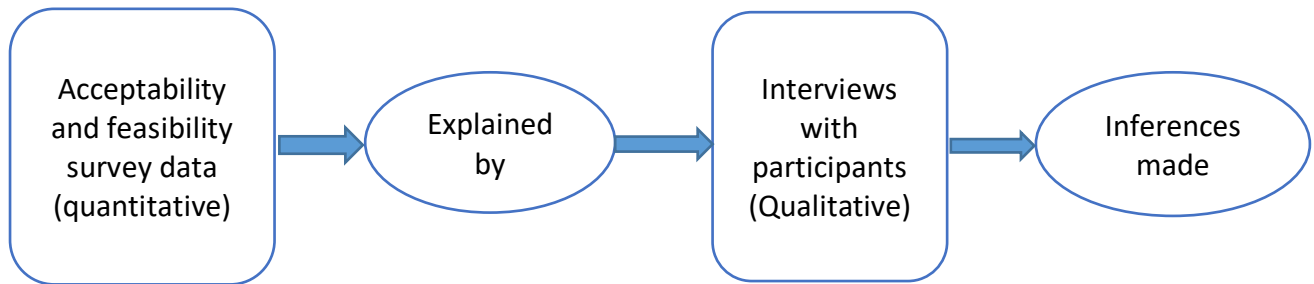


Figure 4 Explanatory sequential design for the study

Integration refers to how the quantitative and qualitative data are intentionally brought together in a mixed methods study (Creswell 2017). In this study, the interview and focus group data were used to explain the survey and attendance data and integration occurred at points where qualitative and quantitative data collection intersected. Integration was chosen as the preferred option for data analysis to realise the benefits of mixed methods and was a feature of the study design, method, interpretation, and reporting (Fetters, et al., 2013). The qualitative and quantitative data were linked in the one analysis (Hall, 2020), as this provided a ‘cognitive framework for interrogation’, which structured subsequent discussion, and an opportunity to gain new insights (Guttermann, et al., 2015 P554).

Integration of data was also evident when inferences were being drawn from the findings.

Figure 5 illustrates the integration process for the study.

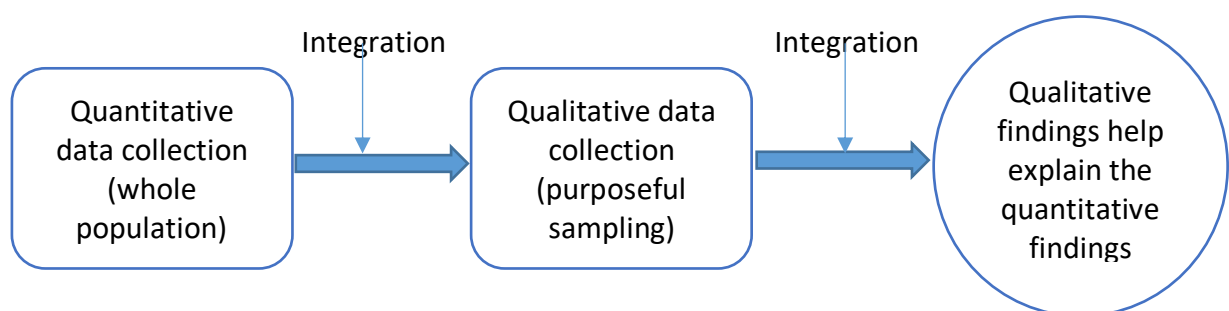


Figure 5 The integration process for the study

3.3 Theoretical Framework

Use of theoretical frameworks in mixed methods studies is growing but not yet firmly established in research practice. A theoretical framework can act as a map for researchers, guiding the journey through the research process, providing a credible, theory-based result, and supporting implementation of findings into practice settings. A theoretical framework that is a poor fit, however, risks distorting the data, and researchers must be alert to the possibility that the chosen framework and the data may be incompatible (Sandelowski, 2000). A review of the published mixed methods literature in 2011 identified only 28 studies that had clearly incorporated theoretical frameworks into their research design (Evans, et al., 2011). Undoubtedly inclusion has since accelerated as mixed methods research has gained in popularity, and increasingly, theoretical frameworks provide a conceptual lens for such studies.

Complex, uncertain, ill-defined, and potentially unstable problems, such as retention of early career nurses, fall into the 'low swampy ground' (Schon, 1983, 1987) where research is less adherent to methodological rules (Miles and Huberman, 1994) and where methods and epistemologies must conform to the setting (Evans, et al., 2011). It is in these contexts that a theoretical framework is useful to enable the connection of thoughts about the 'nature of knowledge with our efforts to produce it' (Morgan, 2007 P68). A theoretical framework can provide an 'organisational hook' on which to hang the project (Sandelowski, 2000) and offer an efficient mechanism for bringing together observations from separate aspects of a complex study, such as this one. The orderly nature of a theoretical framework can add coherence to the findings, allow a utilitarian dissemination of results, and act as a guide to understanding of phenomena (Evans, et al., 2011). To add structure to this study, it was important to identify an appropriate theoretical framework that would contribute to the coherence and synergy of the methodology and findings.

This study was underpinned by organisational empowerment theory, which was chosen because of the synergy with evidence in the literature about nurse retention, and the interaction between an individual and the organisation that they work within.

Organisational empowerment theory, as first defined by Kanter (1977), was introduced in

Chapter 1 of the thesis. A more recently developed perspective on organisational empowerment theory is the process perspective, pioneered by Seibert, et al. (2011). The process perspective concludes that it is the relationship between the structural antecedents in an organisation and the resulting psychological states, that lead to empowerment. Identification of this relationship between the qualities of the organisation and the wellbeing and subsequent performance of the workforce is particularly informative for development of organisational empowerment interventions and proved influential in both the design of this study and the interpretation of the results. This aspect of the theoretical framework encouraged a focus in the study on the wellbeing of the participants and their perspectives of the relationship they had with their host organisation. Recognition of the links between organisational structure and psychological wellbeing reinforces the relevance of the construct of empowerment to nurse retention. Work related attitudes and behaviours, such as job satisfaction, job strain, organisational commitment, turnover intentions, and task performance, are mediated by structural constructs, and are the attitudinal consequences of perceptions of organisational empowerment (Seibert, et al, 2011).

Crucially, empowerment is a multilevel construct, described at individual, organisational and community levels, with each level of the construct interdependent with the others (Zimmerman, 2000). However, organisational empowerment is more than a collection of empowered individuals (Perkins and Zimmerman, 1995), and the focus is on the nuanced relationship existing between the individual and organisational levels. This is reiterated in Chapter 1 where evidence is presented demonstrating causal relationships between the work environment and decisions to stay or leave a role or the profession. When considering nurse retention in this study, organisational empowerment theory was useful to organise the new knowledge and advance potential conclusions, with particular focus on whether an 'active, inspired progression' of the students and early career nurses has occurred (Friend and Sieloff, 2018). Organisational empowerment theory informed initial conception of the study, to the co-production and implementation of the intervention, the chosen measures for evaluation, and interpretation of the results. The design was conceived to model an empowered organisation by involving students and early career nurses in the development of the intervention. By focusing on the voices of the participants to understand the

acceptability and feasibility of both the co-production process and the implementation of the intervention, the intention was to offer participants the opportunity to influence and initiate change, key elements of workplace satisfaction (Twigg and McCullough, 2014). Organisational empowerment theory, together with the body of knowledge about nurse retention, also provided a lens through which to interpret the results. In particular, the discussion section of this thesis considers the interrelationship between the participants and the organisation to which they are aligned, and their perceptions of the co-production and implementation of the intervention that was designed to support their individual empowerment.

3.4 Study Setting

This study was a collaboration between Barts Health NHS Trust and City, University of London and was designed to explore early career nurse retention within Barts Health NHS Trust. Both were named partners on the successful Burdett Trust for Nursing grant application for the wider study [Grant number: SB\ZA\101010662\253815].

3.4.1 Barts Health NHS Trust

Barts Health NHS Trust is the largest NHS Trust in London and one of Britain's leading healthcare providers. It is a large inner city healthcare organisation that was established in 2012. The Trust currently operates from five hospital sites in East London, which are geographically disparate, with a maximum distance of 10 miles and a minimum distance of 1.5 miles between sites. The oldest site is St Bartholomew's Hospital, which has provided continuous patient care since 1123 and became part of the NHS in 1948. It is now a specialist cardiac and cancer centre. St Bartholomew's Hospital joined with the Royal London Hospital in 1994, and in 2012 the organisation expanded again to encompass Whipps Cross Hospital, Mile End Hospital, and Newham University Hospitals, which form Barts Health NHS Trust. The Trust offers care to 2.5 million patients in east London and beyond and has over 16,000 staff over the five sites. Over 72% of the staff are female, 20% are Black, and 30% are Asian.

The five hospitals that form Barts Health NHS Trust each retain their unique character, whilst functioning under the oversight of the Trust governance and quality processes. The Trust has well-defined values (Barts Health NHS Trust, 2021); however, the complexity and size of the organisation pose challenges for strategic communication and potentially support diverse organisational sub-cultures. Each hospital site has a leadership structure including a Director of Nursing and Associate Directors of Nursing, overseen by one Chief Nurse for the whole organisation. The Education Academy is based at The Royal London Hospital, with education delivery at all sites. The Academy provides clinical placements for 2,500 undergraduate medical students, 1,040 junior doctors, over 800 children's nursing, adult nursing, and midwifery students, and 275 allied health professional students each year. Students may be studying with any of a range of universities in London. City, University of London has an established relationship with the Education Academy, as the current School of Health Sciences is composed of the former St Bartholomew School of Nursing and Midwifery and the School of Allied Health Science.

Barts Health NHS Trust had an average annual turnover of 16% at the commencement of the study for nursing and midwifery staff, which was above the national average, although aligned with London turnover rates. Vacancy rates nationally were highest in London (15.3%) and lowest in the North East and Yorkshire (9.5%) (Royal College of Nursing, 2020). Barts Health recognised the retention issues amongst newly qualified nurses and took initial steps to limit turnover such as listening events, staff surveys, an extended transition and preceptorship programme, and the implementation of a buddying scheme between students and qualified nurses. The aim of this study was to build on these positive innovations by designing and testing acceptability and feasibility of a novel intervention. The intervention aimed to increase retention of City, University of London nursing students who qualify and choose to work at Barts Health as early career nurses.

3.4.2 City, University of London School of Health Sciences

City, University of London is based in central London, with a tradition of providing education relevant to business and the professions dating back 160 years. The student body consists of around 20,000 students who are aligned to five Schools, one of which is the School of

Health Sciences. Around 55% of the students in the university are from Black, Asian, Minority Ethnic backgrounds (BAME) and 36% identify as White. Just under 60% of students are women. The University employs around 2,200 staff, with 26% from BAME backgrounds, and 52% women.

This study was delivered from the School of Health Sciences, which has strategic aims related to research excellence, delivery of high-quality education, and sustainable and productive partnerships. The School offers undergraduate and postgraduate programmes related to nursing, midwifery, optometry, radiography, and language and communication science. The programmes are regulated by professional and statutory bodies that enable the students to gain professional qualifications, and practice in related healthcare occupations once qualified. Around 300 pre-registration adult and child nursing students are registered each year, with a total of around 900 studying at any point in the School.

3.4.3 Relationship between City, University of London, and Barts Health NHS Trust

Barts Health NHS Trust supports around 400 adult and child student nurses from City, University of London in 1000 clinical placements each year, and many of these students go on to work in the organisation. The relationship between the two organisations is therefore of mutual benefit. However, the two organisations are culturally different, with divergent aims and areas of focus. City, University of London is a higher education institute (HEI), and as such has priorities related to student experience, student attainment, and national and international reputation for research. Barts Health NHS Trust is a healthcare organisation with priorities related to high quality patient care, timely and efficient service delivery, and patient satisfaction. Both organisations are held to account for their performance by national bodies, and poor performance can have a significant effect on future financial income. These differences in organisational function have the potential to result in tensions in the relationship, and partnerships need to be carefully managed so that they remain effective, productive, and symbiotic. This was particularly relevant for this study, which although jointly conceived by a key leader in the Education Academy at Barts Health NHS Trust and researchers at City, University of London, was not necessarily a key focus for the healthcare organisation on all sites and for all layers of nursing hierarchy. The need to

manage relationships and pragmatic implementation of the intervention led to an emphasis on feasibility and acceptability of both process and intervention during the study.

3.5 Reflexivity

Reflexivity has been described as the defining feature of qualitative research (Gough, 2017) and is a method of reframing subjectivity as a resource that enriches the research process and outputs (Finlay, 2002). It is particularly relevant to research processes involving co-production, and as such has a significant role in this study.

The centrality of relationships in the co-production of knowledge highlights the potential benefits of reflexivity to navigate the inevitably dynamic relationship between co-producers. Reflexivity is a technique used to unpick the assumptions made by researchers and practitioners, and the influence that each has over the other, refuting any claim to objectivity (Alvesson and Skoldberg, 2000). It has been demonstrated as useful in the co-production process (Orr and Bennett, 2009; Gillard, et al. 2012) to allow the research team to explore the context of their contributions and the impact this has on the resulting research conclusions. This highlights the political dynamics of methodological choices made during the research process, at both macro and micro level (Orr and Bennett, 2009) that may otherwise not have been represented. Reflexivity, like co-production, can be described as disrupting common discourses and practices used to describe reality (Pollner, 1991). It is of utility in the co-production process because it helps to produce novel insights into how the outputs can be of benefit to both academic, service user, and practitioner communities.

Reflexivity is rooted in constructivism, a way of consciously revealing the underlying beliefs and values held by the researcher and the impact these have on the methodological approach (Shacklock and Smyth, 1998). It is an acknowledgement that both the researcher and the researched shape the encounter (Probst, 2015) and that the creation of new knowledge is a collaborative endeavour rather than the confirmation of prior assumption. The epistemology of this study; valuing co-production, engaging participants in qualitative interviews and working in partnership with clinical practice, suggests that transparency about the researchers' potential biases, power differentials and competing interests are key

to the rigour of the research process and interpretation of the findings, especially given the interpretive paradigm underpinning the data collection.

Finlay (2002) suggests that excessive self-examination can preclude focus on the research participants and the process of continual internal dialogue and critical self-evaluation may not be natural to all researchers (Berger, 2015). Whilst benefits for the individual include potential personal growth and insight, reflexivity can also evoke self-doubt, frustration, and vulnerability when one's own assumptions are questioned (Probst, 2015).

To support the research process, and as recommended by Gough (2017), a research journal was incorporated into the co-production process for this study and was used by individual researchers to explore their own positions, thoughts, and conclusions. This was important as it facilitated the research team to identify their own biases, born out to individual experience, characteristics, and background, and subsequently guard against imposing these on participants or fellow researchers. It also allowed the team to be conscious of their starting point when interpreting data. Regular reflexive discussions with the research and supervisory team also supported interpretation or interrogation of prevailing assumptions (Berger, 2015). In addition, attention to the discourse of the research team helped to identify individuals' particular perspectives and agendas and further examination of these was prompted during group discussion.

3.5.1 Author Positioning

Exploration of my own position in this research study was integral to reflexive practice and influenced the management of my multiple identities. I am an academic with leadership responsibility in the institution where the study was being conducted, line manager to the research assistant and research fellow, a PhD student, and a nurse who has chosen to leave clinical practice. At the beginning of the process, reflexivity raised awareness of potential issues, such as ethical dilemmas when working with students as research participants; ongoing reflexivity allowed me to consider the impact on the process. Acknowledgment of my own subjectivity led to both reflexive bracketing (Tufford and Newman, 2010) and the exposure of false claims to objectivity (Lynch, 2000).

This study was a partnership project with Barts Health NHS Trust, who also partner the School by providing practice placements, which are a significant part of our academic programmes. I needed to maintain a relationship with Barts Health both as an academic with investment in practice learning and a researcher with investment in the nurse retention study. I was aware that potential conflicts of interest may have occurred if participants gave negative feedback in either the co-production group or the qualitative interviews about placements or clinical environments that we use for our students. There was some tension between the need to consider the confidentiality assured to participants during the interviews but also the duty of care to students on placement and quality assurance of the practice environment (NMC, 2018).

The intervention was implemented to find out what works and what does not work, and both are laudable research aims, however I was aware that external perception of success would impact on the research reputation of the School of Health Sciences and potentially influence further research partnerships with Barts Health. Whilst co-design of the intervention was central to the research process, the perceived need for a positive effect on nurse retention potentially influenced decisions around intervention design, and as such care had to be taken not to impose or exploit the power differential during the co-production process.

I hold a position as an academic, which bestows on me a duty of care to students at the Institution. As a researcher, I also hold personal motivation to recruit participants to the study. The study has been subject to scrutiny by both internal ethics committees and external HRA and Research and Development processes, but I had to be conscious of any coercive influences that may have driven participant recruitment in order to preserve integrity and altruism (Reid et al., 2018).

A significant part of the data collection for acceptability and feasibility was by questionnaire. The issue of survey fatigue in higher education is a recognised phenomenon (Adams and Umbach, 2012). As an academic as well as a researcher I was aware of motivation from the School to encourage students to complete survey responses to the National Student Survey

and module evaluations. I had to be able to balance the requirement for data collection within this study with the need for students to remain positive towards survey completion. Managing multiple identities is a significant issue in healthcare research (Reid, et al., 2018). As a registrant, confidentiality versus disclosure of unsafe practice may raise conflicts of interest. To mitigate such conflicts, the consent forms for this study clearly identified that disclosure of unsafe practice would not remain confidential to an interview, shifting the balance of power to the interviewee in their choice about what they reveal or withhold.

I last practised in a clinical setting nine years ago and although I still regard myself as a nurse and it is core to my professional identity, the fact that I have chosen to work outside of the clinical setting means that I have experiences that align (or contrast) with the population in the study. I am acutely aware of the paradox between my decision to leave clinical nursing and the aim of the study, which was to encourage nurses to stay in their roles and the profession, and as such I regularly revisited my motivation for undertaking the study. I was also careful to guard against imposing my own views on my positive move into academia from nursing practice on research participants and fellow researchers.

My experience may have been very different from that of the participants as my early career nurse experience was in a different time in the evolution of the NHS. I also have personal characteristics and experience that motivate me to make decisions and take specific action; these may also be very different to those of the research participants. For example, I am a white, British researcher and many of the research participants were from Black, Asian and minority ethnic communities. Probst (2015) acknowledges that assumptions of shared understanding are a potential danger when studying members of a group to which one belongs. It was important for me to remain wary of imposing my own beliefs, values and perceptions when interpreting the data (Drake, 2010). Conversely, an advantage of shared language and perceptions of researchers as peers can promote trust between the interviewer and interviewee and result in more genuine data, which may have enhanced the outcomes of the study. In order to achieve optimum outcomes, I reviewed the transcripts of each interview to explore how I could refine my technique and avoid leading or biased questioning, that may have consciously or unconsciously prompted or encouraged the desired answer, and to ensure I demonstrated cultural humility. When

interpreting the data, use of a journal to record and revisit thoughts and conclusions, supported more transparent research team discussions and individual consideration of the data.

Given the nuance and complexity associated with research in an academic context, I also remained conscious of my status as a learner in the research process. As such, supervision was important to help me navigate through the process.

3.6 Ethical and Regulatory Considerations

Ethical issues should be at the heart of study design and decision making throughout the research process (Ritchie et al, 2014). Education and health research are governed by ethical guidelines and codes such as those of the British Education Research Association (BERA) (2018) and the UK Policy Framework for Health and Social Care Research (NHS Health Research Authority, 2020), which set out, under broadly similar principles, the expectations of health, social care, and academic researchers. The principles, at a high level of abstraction, support the research to:

- Ensure participation is voluntary
 - Participants should be free from coercion or pressure
- Ensure participation is based on informed consent
 - Participants should be afforded respect and autonomy and able to make an informed choice based on adequate transparency of risks and benefits
- Maximise benefit and minimise harm
 - This includes consideration of safety and the interests of the individual prevailing over those of science or society
 - All research should respect the privacy, autonomy, diversity, values and dignity of individuals, groups and communities.
- Respect the confidentiality and anonymity of participants
 - Research should adhere to the legal and ethical requirements of the Data Protection Act (DPA) (United Kingdom Government, 2018) and the General Data Protection Regulations (GDPR) (European Union, 2016)
- Be worthwhile

- Research should be conducted with integrity, by competent researchers and should ideally incorporate public involvement
- Research should employ the most appropriate methods for the research purpose

Detail of how these principles were considered, incorporated into the design this study, and how they were operationalized is explored in the following sections.

3.6.1 Voluntary participation

Discussion of the voluntary nature of participation in research is recurrent in research ethics literature (Ritchie, et al., 2014) and refers to the principle that potential participants should be able to make a choice about whether to participate without feeling pressure to do so. Two conditions must be present for this to happen: intentionality (choosing a course of action rather than accidentally doing it), and substantial freedom from controlling influences (Nelson, et al., 2011). In relation to this study, intentionality has been interpreted as the requirement that participants were aware they are deciding to take part in research, were aware that they would not be penalised for non-participation, and that they could withdraw at any time without giving a reason. The research team provided sufficient information in the form of a participant information sheet and opportunities to ask questions and clarify issues, to enable this understanding.

Central to the principle of voluntariness is consideration of coercion. Participants may feel coerced into participating if they are offered excessive remuneration or reward or if there is a power imbalance between the researcher and the participant (Hardicre, 2014). The vulnerability of nursing students as research participants centres on the fact that researchers may also be their lecturers (or at the least are associated with the University) and as such students may believe they can influence their programme outcomes, including assessment (Ridley, 2009). Given this potential power imbalance between students and academic staff, a non-academic member of the research team was chosen to facilitate initial recruitment. The participants were rewarded for their time and effort with an online shopping voucher. As this was a £10 voucher, it was not considered excessive or large enough to exert influence.

The level of influence exerted in specific circumstances is difficult to measure due to the complexity of individual perception, which is based on prior experience, individual beliefs, and contextual detail (Kahneman, 2012). The research team paid attention to how they framed the study-related information so that they did not stray along the continuum of influence beyond persuasion to manipulation or coercion. Presenting reasoned arguments to encourage participation is a rational and non-controlling form of influence. Manipulation or coercion are successively more controlling and therefore not compatible with voluntary participation (Nelson et al., 2011).

3.6.2 Informed Consent

Informed consent is central to ethical research and is also underpinned by law (Hardicre, 2011). At the fundamental level consent comprises of three elements: adequate information, voluntariness, and competence (Beauchamp and Childress, 2009). It is important that participants were given enough information to make an informed decision about whether they wanted to take part, and this was supported by the provision of detailed participant information sheets that were written in accessible language. Opportunities to talk to the study team and allowing participants time to consider the information that was provided also supported the process.

Participants had to also have capacity to make a free and informed choice and as such be able to demonstrate that they understood the aim of the study and what participation involved. The participants in the study were all adults, who were undertaking or lecturing on the Pre-registration Nursing Programme at City, University of London. Although the study team were not able to assess the mental capacity of the participants, it was not anticipated that there would be any physical or mental barriers to their participation.

The process for gaining consent from student participants is outlined in Figure 6 and the process of gaining consent from staff members is outlined in Figure 7.

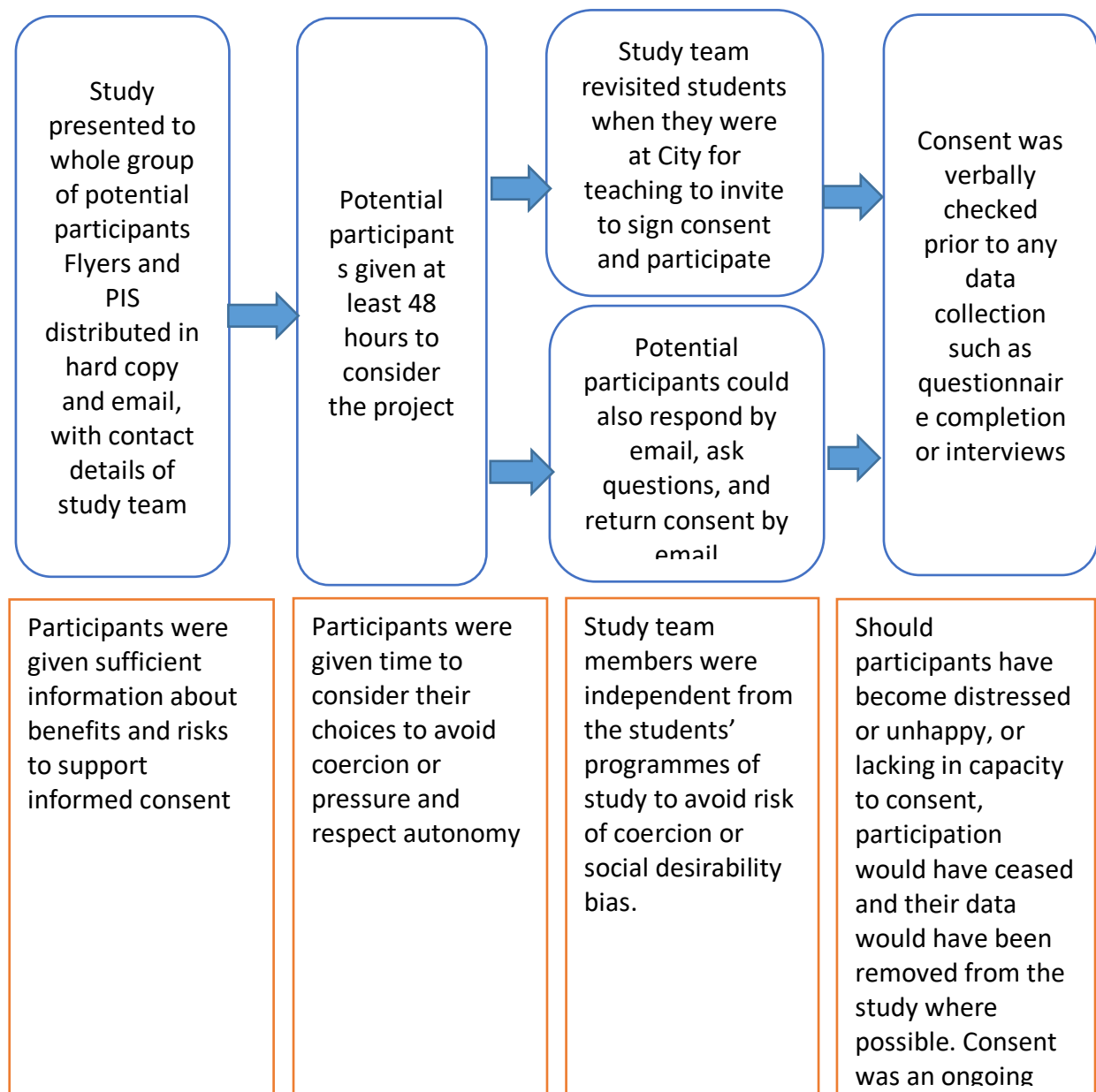


Figure 6 Process for gaining consent from student participants

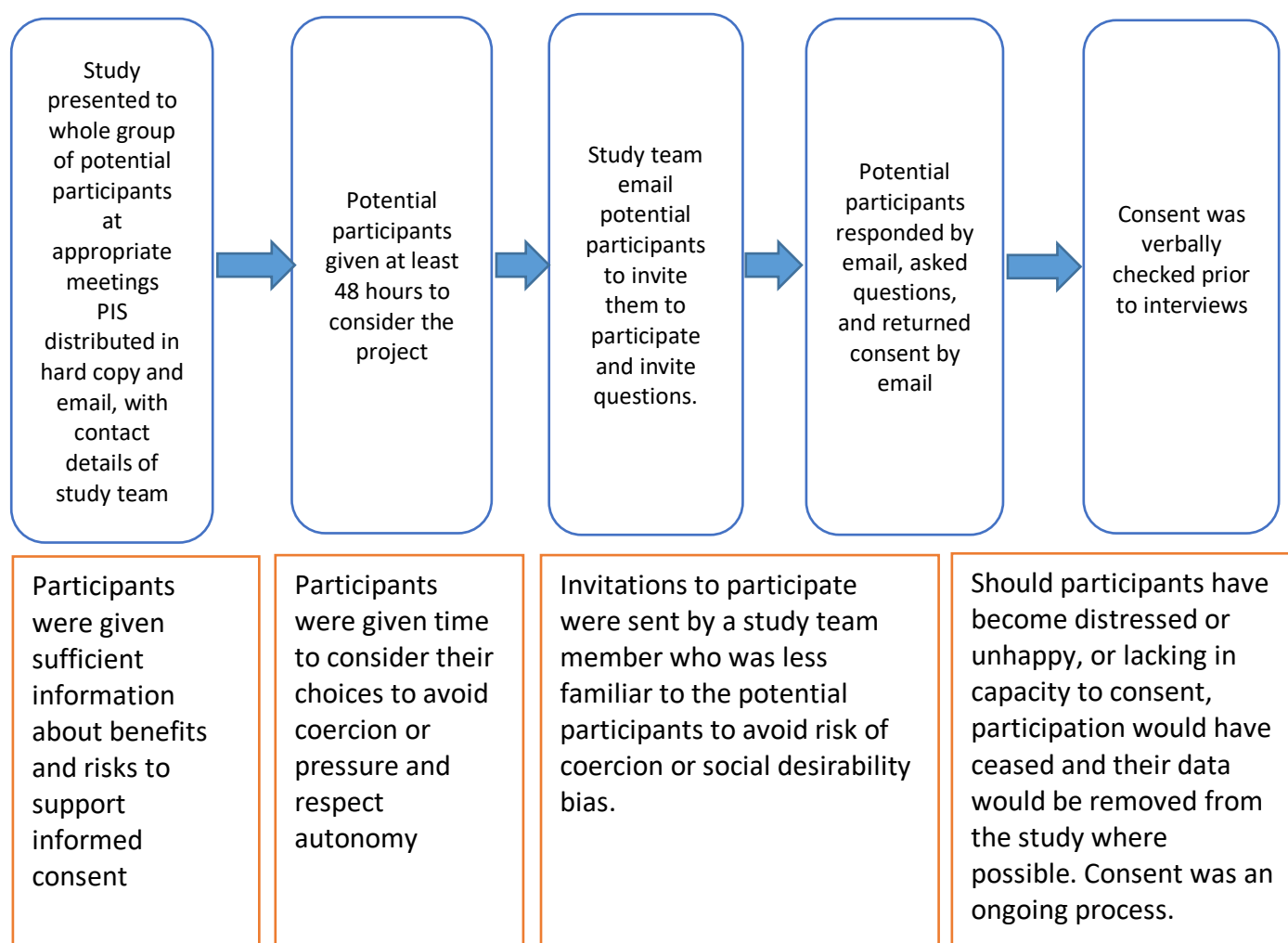


Figure 7 Process for gaining consent from staff participants

3.6.3 Non-maleficence and Beneficence

The ethical principle of non-maleficence when applied to research suggests that researchers should do no harm, either physically, emotionally or by restricting autonomy (Ridley, 2009). Sufficient forethought is required during research planning to anticipate any risk. In this study, potential risk was related to harmful breaches of confidentiality, or emotional or psychological harm to participants from exploring sensitive issues during data collection. Detail of how confidentiality was maintained is outlined in the following section.

Data regarding acceptability and feasibility, for example, attendance logs, session content evaluation, accounts of individual experience of the intervention, were collected via questionnaire and interview. It was not anticipated that collection of these data would result in any harm or discomfort to participants or researchers, however the following precautions were taken to signpost participants to supportive services if they had disclosed any issues that required resolution.

- If a participant disclosed an emotional or psychological issue during the research, they were given the contact details of the student or staff counselling service and advised to contact them.
- If a participant disclosed health issues, they were advised to contact occupational health at City, University of London, or their own GP.
- If the participant was a student and disclosed issues associated with practice learning, such as malpractice, poor practice or bullying, they were advised to discuss this with their link lecturer and follow the City, University of London School of Health Sciences Raising and Escalating Concerns in Placement policy.
- The researcher had an obligation as a registrant to act on any disclosure of unsafe practice that may bring harm to patients or colleagues (NMC, 2018). The researchers ensured that the participant was aware of this when they consented to be interviewed and was informed prior to any action.

Beneficence, in contrast, is about actively benefitting others and in research terms this relates to providing an appropriate and worthwhile intervention that leads to greater benefit than harm (Ridley, 2009). Whilst the pursuit of improved education is beneficent, the perception of the participants about benefit may differ from that of the research team. The collection of acceptability data was helpful to inform revision of the intervention to maximise benefit for future recipients.

In the interests of veracity, the Participant Information Sheet was used to inform potential participants of the anticipated benefits to both themselves and the nursing community of the study findings. The potential benefits to their transition into qualified nursing practice

was reiterated prior to collection of data so that they could make an informed choice on the balance of benefits and risks.

3.6.4 Respecting the confidentiality and anonymity of participants

The Data Protection Act (DPA) 2018 and the General Data Protection Regulations (GDPR) 2016 outline the seven key principles and associated regulations that underpin personal data protection. In operationalising these principles GDPR regulations require that personal data should be processed lawfully, fairly and in a transparent manner; collected for specified, explicit and legitimate purposes; adequate, relevant, and limited to what is necessary; accurate and kept up to date; kept in a form which permits identification of data subjects for no longer than is necessary; and processed in a manner that ensures appropriate security of the personal data (GDPR, 2016). The following paragraphs offer detail of how these principles were upheld during this study.

All participants were required to read the Participant Information Sheet prior to participating in the study. The Participant Information Sheet clearly outlined the commitment of the study team to maintaining participant confidentiality and the circumstances in which this would not be possible. Interviews were only transcribed by administrators external to the study team once a confidentiality agreement was signed and programme lecturers were notified who had participated in the study.

To anonymise the participants, they were all assigned a participant number following their initial point of data collection and this was used throughout the remainder of the project, including interview transcripts, any additional data collected and subsequent report. Data and identifiers were kept in separate, locked filing cabinets. All identifiable information pertaining to individuals, teams or places was redacted from interview transcripts. Where participants had specific characteristics that may make them identifiable, their comments were carefully quoted to ensure that they remained anonymous. Subjects were referred to by a pseudonym in any publications arising from the research and carefully quoted so that they remained anonymous.

Sound files were deleted immediately after transcription and checking of interviews. All transcripts were stored on password protected City, University of London computers and only the research team had access to the full dataset. The identity of individuals who provided data will be destroyed within three months of completion of the project. In accordance with City, University of London guidelines, the remaining data (e.g. baseline data, study protocol, interview transcripts and data analysis documents) will be securely retained for 10 years from the date of the project finishing. An evaluation archive log will be completed, and hardcopy data will be archived in a secure room. Electronic data is stored on a file and when this file is ready, IT will be contacted with a request to archive the files. Hardcopy files will be dropped in a secure bin or confidential waste bag. Electronic files will be deleted.

3.6.5 Research Regulatory review

It is important that the research is a worthwhile study, conducted with integrity with clear aims and objectives. Scrutiny of the research design and process by both peers and regulators support the study to employ the most appropriate methods for the research purpose. This PhD study was overseen by three supervisors, which added a level of scrutiny to the conduct of the project team as an additional safeguard to good research practice. The supervisory team was responsible for informing the development, delivery, evaluation, and dissemination of the project. The co-production element of the study also added a level of external involvement that offered opportunities for poor practice to be exposed.

The project received ethical approval from City, University of London School of Health Sciences Research Ethics Committee, reference: Staff/17-18/18. Judgements about ethical approval were made in accordance with the British Education Research Association Ethical Guidelines for Educational Research (BERA, 2011). The study was also approved by the Health Research Authority (21.06.18: IRAS ID: 245992) and by Barts Health NHS Trust Research and Development (02.07.18: R&D No: 012400) with respect to research capacity.

3.7 Summary

This methods and methodology chapter has introduced the overall study design and rationale for using an explanatory sequential mixed methods design. The chapter clarified that the theoretical framework of organisational empowerment introduced in Chapter 1 was used to underpin the design, methods, and interpretation of the results from the study. Elements that are common to phase 1 and phase 2 of the study are explained in this chapter, including detail of the study setting, and how this influenced the study design, reflexivity, and ethical considerations. The following two chapters will present more detail of the methods used to develop and implement the intervention and include published papers that present the results from each phase.

Chapter 4 Study Phase 1: Development of the intervention

The aim of this study was to develop an intervention, drawing on currently available evidence, and using a co-production process with students and early career nurses. This chapter explores the development of the intervention, including the methods used, the characteristics of the intervention, and the findings from the evaluation of the co-production process.

4.1 Aim

Phase 1 of the study aimed to develop the intervention using co-production and evaluate the process. The objectives were:

1. To undertake and evaluate the process of co-production of an intervention to increase retention and decrease turnover of early career nurses.
2. To explore how the group of early career nurses and students used current evidence and experience to co-produce the intervention.
3. To explore the experiences of students and early career nurses during the co-production process.
4. To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process from the perspective of participants.

4.2 The co-production processes

The concept of co-production was introduced in Chapter 1, with reference to its growing importance, often through use of co-design, in the health service context. It is used to harness the knowledge and experience of relevant stakeholders to make changes related to issues of relevance to them (Batalden, et al., 2016;), and in so doing, co-creating value at the service or clinical microsystem level in healthcare organisations (Nelson, et al., 2011).

Co-production was incorporated into the design of this study to maximise the potential for the voice of early career nurses and student nurses to be prominent in the development of the intervention. Co-production was used as a mechanism to capture the lived experiences

of those most affected by the transition from student to newly qualified practitioner, and the potential impact of that experience on retention in the profession. In addition, including student and early career nurse voices had potential to bring credibility to the final product. This could result in greater engagement with the intervention by the wider group of student nurses, as the final product would be more likely to resonate with those affected (Coppock, 2011).

Co-design is an increasingly used co-production approach that attempts to engage all stakeholders in the development of a product, care pathway, or intervention, to ensure the product meets the needs of the users (Sangiorgi and Prendiville, 2017). In a recent rapid evidence synthesis of co-production and co-design in acute healthcare settings (Clarke, et al., 2017), 8 out of 11 studies included in the review used either experience-based design (EBD), experienced-based co-design (EBCD), or accelerated experienced-based co-design (AEBCD) as the staged process for co-production. All these approaches include patients, carers, and staff working together to review and improve patient and carer experiences of healthcare services. This direct involvement of those individuals with experience of the services, and their ownership of the work to design improvements, has been linked to the success of the EBCD process, as it supports the partnership between all parties (Tsianakas, et al., 2015; Bowen, et al., 2013; Vennik Devande, et al., 2016; Mckernon, et al., 2011). The numerous published evaluations of the EBCD process demonstrating positive outcomes were a motivation for its incorporation in this study.

4.2.1 Experience Based Co-design

Experience-based co-design (EBCD) is an approach that has been widely used to co-design healthcare services as a partnership between staff and patients and is supported by a growing evidence base that attributes positive, sustainable change to the process (Clarke, et al., 2017). EBCD is a qualitative process based on a series of structured participatory events that focus on experience and emotion rather than attitudes or opinions. It utilises storytelling to identify and provide insight into key areas of service delivery that can be improved. The step-by-step process is available on the Point of Care Foundation website ([1. What is Experience-based co-design? - Point of Care Foundation](#)) and starts with facilitators

conducting interviews of patients and staff to understand their perspective and experience of a service or pathway. These interviews are recorded and edited to create a 30-minute film which is then shown to staff and patients/carers separately to gain feedback. The film is designed to trigger further discussion and provoke debate about the issues raised, or similarities and differences between the experiences of participants. A joint event is then held to agree areas to focus on for improvement and the co-design group continues to meet over a 4–6-month period to work on these agreed improvements. Templates and guidance for the group meetings are provided by the Point of Care Foundation to standardise the process and maximise successful outcomes.

Although EBCD has been developed and widely used in healthcare settings, the flexibility of the approach lends itself to adaptation and use in alternative settings. The Point of Care Foundation stress that, if the central elements of the approach are retained ‘it is not essential to stick rigidly to the EBCD approach’ (15. Adapting the approach to your budget - Point of Care Foundation) and suggest that facilitators should not feel constrained by the methodology as long as the process includes interaction between patients and staff, and patient interviews. In the context of this research, EBCD was used in a novel setting that spanned acute healthcare and educational organisations. Instead of engaging with staff and patients, early career nurses, student nurses, and researchers formed the co-production partnership. Evaluation of the use of EBCD to co-produce the intervention in this novel setting was therefore important to ascertain suitability of the process in future similar initiatives.

The Accelerated EBCD approach was chosen for this study as it had a better fit with the focus of early career nurse retention and was also deemed appropriate due to time and resource constraints. Accelerated EBCD is an established alternative to the full-length process where some or all the patient and staff interviews are replaced with archive film. Consideration was given to the potential limitations of using archive film rather than specifically recorded interviews due to lack of local detail. To mitigate risk, some local interviews were included in addition to archive film, which allowed a more local focus. The trigger film is a mechanism to start conversation, and even if those watching the film have not experienced identical issues, it is a way of initiating discussion to consider personal

experiences and solutions. Evidence indicates that the accelerated approach is cheaper, but as effective, as the standard EBCD process (Locock, et al., 2014). The steps taken during the accelerated EBCD process are illustrated in Figure 8. Fidelity to the accelerated EBCD process was high, the variation being the setting and the engagement with early career nurses and student nurses rather than patients or carers and staff.

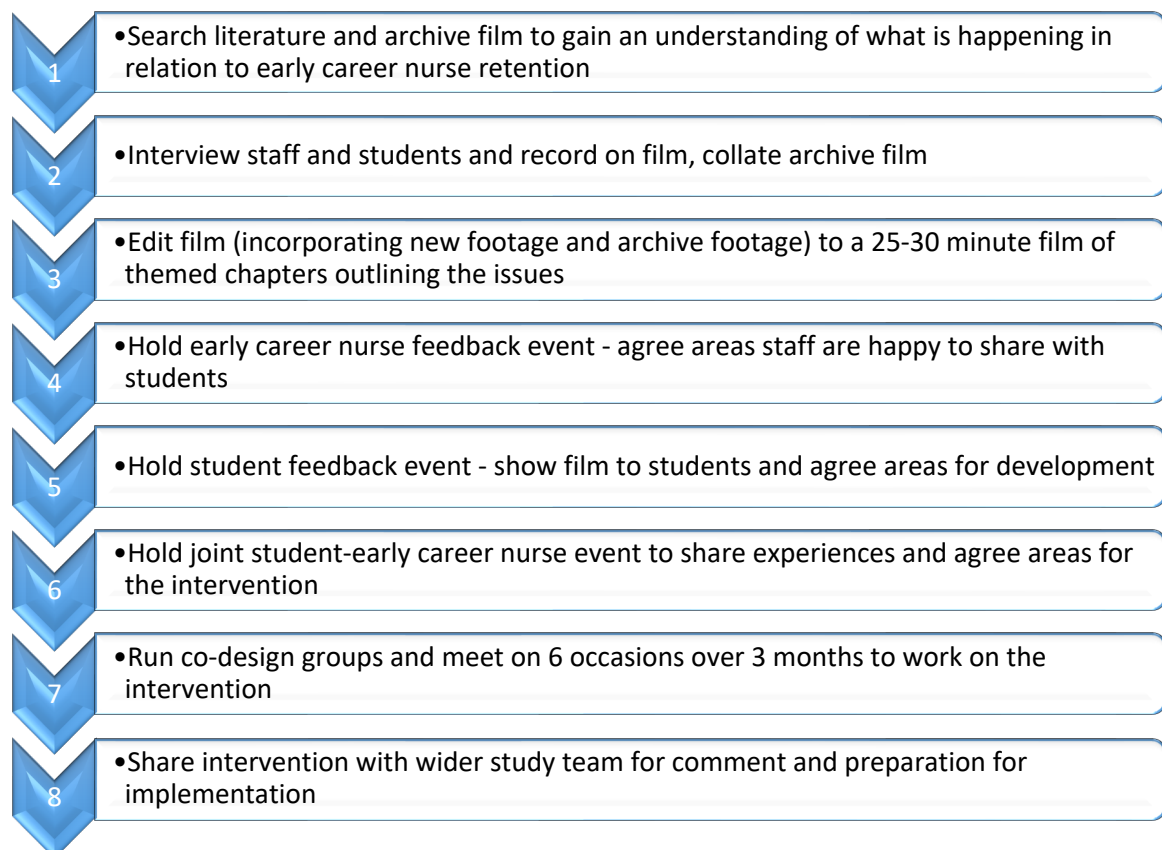


Figure 8 Accelerated Experience-Based Co-Design process

The trigger film was compiled by the research team with support from media experts at City, University of London. The primary aim of the video was to be a compilation that would promote discussion among participants and the content included subject matter related to retention of the early career nurse workforce. Inspiration was taken from extant literature outlined in Chapters 1 and 2 and the video content aimed to offer a broad picture of international, national, and local issues with early career nurse retention, presented via evidence summaries and personal narratives. The video also presented a range of potential solutions that have been successfully implemented, including examples from Barts Health

NHS Trust relating to newly qualified nurse support, wider national initiatives relating to the work environment, and internationally established psychological support programmes such as ACT. The aim of this content was to raise awareness of successful interventions addressing retention so that co-production group members could discuss their own preferences for a local intervention, rather than choose from a limited list of options. As such, we did not claim the video to be entirely comprehensive or of professional quality.

Once completed the film lasted 32 minutes and consisted of 7 themed chapters, including:

1. Introduction from the Dean of the School of Health Sciences explaining the aims of the project and the ambition to co-design an intervention to increase early career nurse retention. This chapter emphasised the importance of sharing views to understand the lived experiences of early career nurses in London.
2. Overview of the situation regarding retention and attrition of early career nurses in London, including statistics and narratives describing a range of perspectives and personal experience by four qualified nurses working in London, and one student nurse. These were taken from Capital Nurse archive and narrated by Rachel, herself early career nurse, who talks extensively about her own career journey.
3. Short, publicly available blog by early career nurse Natasha who raised some of the challenges and highlights of working when newly qualified and her experience of transition from student to qualified practitioner.
4. Second short film by Natasha as she left nursing after 3 years to be a full-time mother. Emphasis on what was good about the job and her reasons for leaving, relating to both structural and personal influences.
5. Interview with Imogen, a research nurse from Barts Health Emergency Department discussing the benefits and challenges to working in the area as an early career nurse and the impact of attrition from the workforce. Included a description of interventions that have already been implemented at Barts such as listening and action workshops, exit interviews, and support for newly qualified nurses such as increased induction period and competency passports.
6. Interview with Judy, PhD student and member of the research team, explaining wider initiatives from nursing literature to increase nurse retention of early career nurses and describing the findings from the systematic review exploring the characteristics of interventions that increase retention and decrease attrition of early career nurses.

7. Interview with Paul, an academic from the Department of Psychology at City, University of London. He discussed resilience, the concepts underpinning psychological flexibility and mindfulness, and how psychological wellbeing programmes such as ACT may have potential as an intervention to support transition to qualified practice.

The film was shown to the group of early career nurse participants and the group of student nurses separately as indicated by the EBCD process. During the feedback events, an emotional mapping exercise was conducted. This was a structured exercise that enabled the participants to identify key points on their transition journey that they felt could have been managed more effectively to support them to stay in the profession. For students this involved speculating about issues that might arise post-qualification, but their discussions were supported by hearing the experiences of the early career nurses in the co-production group and the narratives in the trigger video. The participants created a visual representation of a timeline of their transition journey with highlighted emotional touchpoints or areas that they felt would benefit from change. This formed the basis of the subsequent work to develop the intervention. An important strategy was that the facilitators were guided by the participants rather than influencing the topics of discussion or areas for inclusion in the intervention. The facilitators had a crucial role in providing a safe social space, managing expectations, and enabling co-working and a democratic process when determining priorities for the intervention (Gager, et al., 2020).

4.2.2 Study implementation setting

Development and implementation of the intervention took place on City, University of London sites. Most of the data collection occurred at City, University of London but when participants were in clinical practice placements, some data collection also occurred at Barts Health NHS Trust sites or using online technology. Both City, University of London and Barts Health NHS Trust were familiar to research participants and did not represent intimidating or uncomfortable environments for data collection. City, University of London was chosen because the participants were attending the site for lectures and group activities as part of their pre-registration nursing programmes. It was therefore convenient for both study participants and researchers.

4.2.3 Phase 1 Participants

Two groups of participants were involved in the co-production process including:

1. Students undertaking nursing programmes at City, University of London. Students were invited to participate who were undertaking:
 - Bachelor of Science degree (BSc) Children's Nursing
 - Bachelor of Science degree (BSc) Adult Nursing
 - Postgraduate Diploma (PGdip) Children's Nursing
 - Postgraduate Diploma (PGdip) Adult Nursing
2. Early career nurses working at Barts Health NHS Trust. Early career nurses were defined as those in their first year of practice as a nurse after qualification.

4.2.4 Phase 1 Recruitment

The ethical considerations underpinning the recruitment processes are explored in Chapter 3, section 3.6.

4.2.4.1 *Student participants*

Potential student participants for phase 1 of the study were identified by the course officers at City, University of London School of Health Sciences, drawing on established databases of students by educational programme and clinical placement. Personal data were limited to name, email address and placement area.

Participants were approached and recruited to the co-production group by the researchers. The students did not have had any previous association with these individuals, which lowered the risk of coercion or bias. Students may have felt under pressure to participate if they had been approached by lecturers with whom they were familiar.

Recruitment occurred in the following ways:

1. The Researchers spoke to the identified potential participants in group forums about the study and gave them flyers and participant information sheets for consideration. This occurred when the students were already in the university for teaching sessions.

2. All students who met the inclusion criteria were emailed, with a Participant Information Sheet and consent form attached, inviting them to take part in the study.

Students were rewarded with £15 online shopping voucher for each hour that they spent involved in phase 1 of the study. They were notified of this in the email, the participant information sheet, and discussions about the project.

4.2.4.2 Early Career Nurse Participants

Potential early career nurse participants for the co-production group were identified by the preceptorship coordinator at Barts Health NHS Trust. The coordinator distributed participant information sheets, including contact details of the researchers involved in the project and a request to contact the researchers if they were interested in participating. Early career nurses were rewarded with online shopping vouchers commensurate with an hourly rate of £20 per hour to recognise their commitment and time contribution to the study.

4.3 Acceptability of the co-production process

Co-production has been criticised for lack of rigorous evaluation, both as a process and in terms of the effectiveness and cost-effectiveness of co-produced interventions (Clarke, et al., 2017; Voorberg, et al., 2015). The novel use of co-production and EBCD in this study across healthcare and educational settings presented an opportunity to explore the experience of the participants. Process evaluation is an important part of designing and testing interventions (Moore, et al., 2015), and acceptability is increasingly recognised as a key aspect that provides insight from the perspective of stakeholders (Sekhon, et al., 2017). Although acceptability has often been explored in connection with complex healthcare interventions, measurement of acceptability of the co-production process was seen to be appropriate because of the insight that it would offer into use of co-production in similar contexts in future projects. Equally, co-production can be regarded as an intervention, due to the potential psychological benefit (Etgar, 2008), empowerment (Chan, et al., 2010), development of social capital (Achrol and Kotler, 2006), and skill development (Ballantyne

and Varey, 2006) for participants. Understanding the acceptability of co-production from the perspective of the early career nurse participants, student nurse participants, and the facilitators, was therefore appropriate and important. From the co-production group members' perspective, the values underpinning co-production, the context in which it was implemented, and the approach of the facilitators may all have impacted on acceptability, and subsequently their engagement in the process. Concurrently, if the facilitators perceived co-production to have low acceptability, this may have impacted on their commitment to deliver the EBCD process with fidelity, with consequent impact on effectiveness of the process.

4.4 Phase 1 methods

An explanatory, sequential mixed methods design was used to evaluate the co-production process. At three time points during the development of the intervention survey data were collected to assess the acceptability of the co-production process. This was followed by collection of in-depth qualitative data to explain, and make sense of, the quantitative survey data. Semi-structured interviews were conducted with student participants and facilitators to explore the challenges and benefits associated with attending the co-production sessions and to contextualise their survey responses. The mixed methods design to assess acceptability of the co-production process is illustrated in Figure 9.

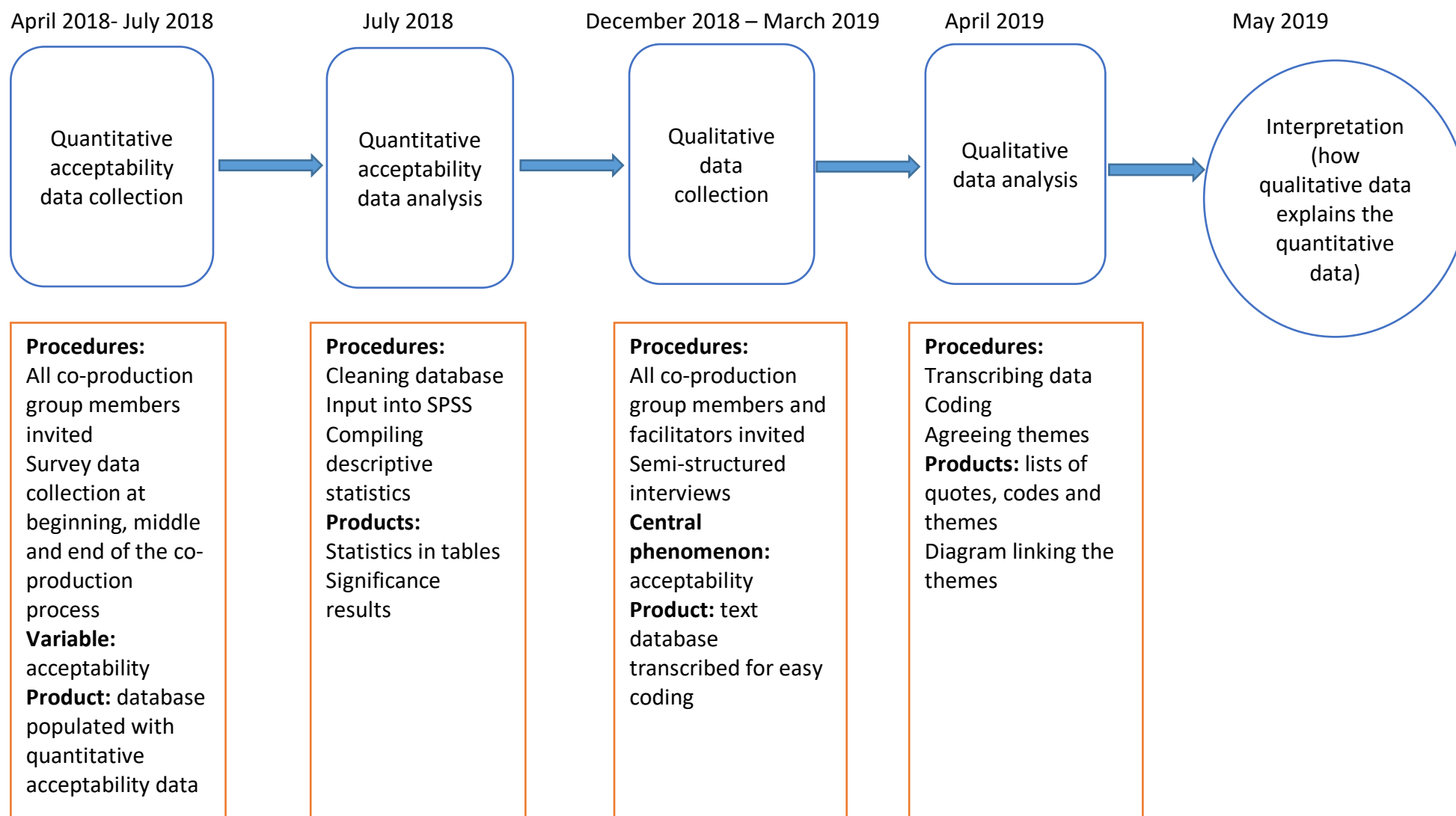


Figure 9 The explanatory sequential design of phase 1 of the study

4.4.1 Phase 1 sampling

All those involved in the co-production process were invited to participate in the mixed methods assessment of acceptability of this process. The co-production group consisted of 12 members, (eight regular participants and four occasional participants) and two facilitators. Involving members and facilitators in both the quantitative and qualitative data collection was intended to maximise the breadth and depth of perspectives collected. As the research had an idiographic aim, the sample size allowed individual cases to have a defined voice in the study, rather than being subsumed into a larger whole (Robinson & Smith 2010). Recruiting 3-16 participants for a study allows for cross-case generalities and prevents data overload for researchers (Smith, et al., 2009).

4.4.2 Phase 1 data collection

Data collection in phase 1 utilised questionnaires and semi-structured interviews to assess acceptability of the co-production process from the perspective of the participants.

4.4.3 Measures: Co-production Process Acceptability

The co-production process was initially evaluated by means of acceptability questionnaires compiled by drawing on the theoretical framework of acceptability (TFA) of healthcare interventions, developed by Sekhon, et al. (2017) (Figure 6). The model comprises of seven constructs: affective attitude; burden; perceived effectiveness; ethicality; intervention coherence; opportunity costs; and self-efficacy, developed through rigorous inductive and deductive processes. To evaluate acceptability, questions were asked that related to each of the seven constructs.

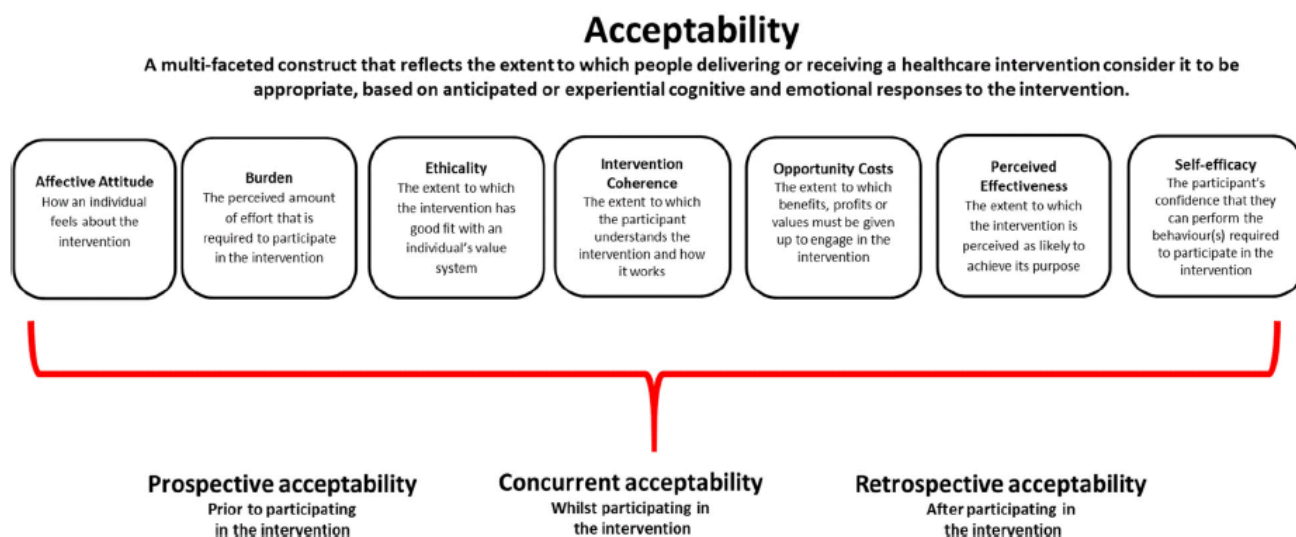


Figure 10 The Theoretical Framework of Acceptability (from Sekhon, et al., 2017)

Although the TFA had not been used to evaluate effectiveness of processes such as co-production, it was chosen because of the utility of the multi-component framework to identify the source of an acceptability issue, making appropriate refinement of the co-production process easier (Sekhon, et al., 2018). Conversations with the author of the TFA confirmed its suitability for use in this context. Of value was the versatility of the TFA to allow for monitoring of acceptability over time, which was considered appropriate for this study due to the novel nature of co-production to the participants. It was anticipated that their perception would change as they grew more accustomed to the style and purpose of the process.

4.4.3.1 Acceptability Questionnaire

The TFA was used to design a questionnaire to assess acceptability of the co-production process by devising questions to address the seven constructs of acceptability. As intended by the original authors, the TFA provided a framework to develop the questionnaire. Rather than a questionnaire that can be adapted, the TFA is a framework that can be used to support the design of tools to evaluate the acceptability of an intervention, for example to develop questionnaires or visual analogue rating scales (Sekhon, et al., 2017), or as a deductive coding scheme (Sekhon, et al., 2017; Murphy and Gardner, 2019; Sekhon and Straten, 2021).

The questions, once developed, were tested for both content and construct validity. Construct validity refers to whether the questions measure the constructs they were designed to measure. For example, there needs to be confidence that when asking a question about affective attitude, the words in the question really do establish how the participant feels about the co-production process, rather than about another process not being investigated. Constructs present a challenge as they are not directly observable or measurable. It is important that the variables chosen to measure the construct allow legitimate inferences to be made about that underlying theoretical construct (Agarwal, 2011). In addition, it is important not to assume that the participants share the same understanding of the language that is used in the questions as the researcher and will interpret the statements in a similar way (Rattray and Jones, 2007). Processes for designing a questionnaire with construct validity tend to be iterative but may include pretesting the questionnaire with experts who may identify issues with wording, and pilot testing the questionnaire (Song, et al., 2015). An additional method could involve conducting a conceptual validation exercise with a small group of individuals, who are not part of the study participant group. The individuals would be asked to sort the questions and attribute a construct to each group of questions to check their interpretation of what is being asked (Agarwal, et al., 2011).

The Acceptability Questionnaire for this study was reviewed by the author of the TFA and was also piloted with a small group of academics not associated with the project and who were not nurses, to gain feedback about clarity. In both instances small changes were made to refine the language. The questionnaire used likert-type scales with additional free text boxes to collect acceptability data. Data were collected prospectively, concurrently, and retrospectively, to explore changes over the duration of the co-production process. Questionnaires were distributed using hard copy and completed at the end of the co-production sessions. The questions used were refined slightly for each data collection time point to reflect the temporal nature of the process. The questionnaire is included as Appendix 5.

An additional consideration was social desirability bias, as the participants may have distorted their answers towards the social norm to project a favourable image of themselves, either because they desired social approval of the interviewer, or because they perceived the question to relate to a behaviour that was socially undesirable (Krumpal, 2013). Social desirability is not related to the sensitivity of the question, rather the sensitivity of the answer and as such the tendency towards giving socially desirable responses may vary according to the characteristics of the individuals in, and the culture of, the participant group (Lalwani, et al., 2006). In this study the co-production group was formed of twelve students and early career nurses and the group was facilitated by researchers. Participants may have felt required to frame the co-production process in a positive light in their responses due to the nature of their relationship with the facilitators, which developed over the six interactive sessions. This may have been especially relevant due to the traditional hierarchical nature of the student/academic relationship (Stroeber and Hotham, 2013). To mitigate social desirability bias, the facilitators gave careful attention to the power dynamics in the group and reassured participants that their answers would remain confidential. It is the belief that responses will be linked back to the participant that may lead to them giving socially desirable responses (Krumpal, 2013). Although the facilitators were present during questionnaire completion, it was self-administered, giving participants more control and privacy around their answers. Self-administrated questionnaires as opposed to interviewer administrated questionnaires are less distorted by social desirability bias (Tourangeau and Yan, 2007). The acceptability questionnaire is included as a supplementary table following the publication later in this chapter and as Appendix 5.

4.4.3.2 Semi structured interviews

Participating in a co-production group was a new experience for the students and early career nurses and their responses to the process were of interest. Semi-structured interviews were conducted with the co-production group members to explore their experience of the process and explain the acceptability survey data more fully. The two facilitators were also interviewed to gain insight into their experiences. Semi-structured interviews are a popular form of data collection in nursing research due to the flexibility of the method and the potential to build reciprocity between the interviewer and the

participant (Galletta, 2013) allowing the interviewer to probe and follow up on interesting points. Semi-structured interviews are suitable for use in situations where participants are being asked to discuss their perceptions, complex opinions, emotionally sensitive issues, or where participants may not have experience of talking about the subject (Kallio, et al., 2016). An interview guide was formulated in advance, the questions being determined following analysis of the quantitative data and decisions about which aspects of the acceptability questionnaire results required further explanation. The Framework for the Development of a Qualitative Semi-structured Interview Guide (Kallio et al., 2016) was used to support the process and incorporated the following phases: 1) identifying that the study has the prerequisites of using semi-structured interviews; 2) retrieving the new knowledge from the quantitative data, together with prior knowledge from previous research; 3) formulating the preliminary guide; 4) pilot testing the interview guide with individuals who were not part of the study; and 5) using the completed interview guide.

The interview schedule is included as Appendix 6 and aimed to explore the experience of students and early career nurses from Barts Health NHS Trust of the co-production process regarding acceptability. The rigorous development of the interview guide contributed to the trustworthiness (credibility, confirmability, and dependability) and objectivity of data, which in turn makes the results more plausible (Galletta, 2013).

Interviews with students and early career nurses were conducted by the author, who had no prior relationship with any of the participants. The facilitators were interviewed by an experienced, independent, female researcher who was not a nurse, was not at the time known to the facilitators and had not been involved in the co-production process.

4.4.3.3 Facilitator field notes

The two facilitators were asked to make reflective field notes after each co-production group meeting. Reflective fieldnotes or journals allow researchers to explore their explicit and implicit subjectivity and make their thoughts and feelings visible (Ortlipp, 2008). By engaging in purposeful reflection and recording their thoughts and observations as field notes, researchers can strengthen the quality of research by demonstrating data triangulation and improving study validity and reliability (Deggs and Hernandez, 2018). Field

notes serve to help construct the thick, rich descriptions of research encounters and document valuable contextual data (Phillipi and Lauderdale, 2018). Despite their advantages, reflective field notes are sometimes seen as a lower form of qualitative data than interview or focus group data. The stance taken for this study was that critical reflection by the facilitators would sensitise the facilitators to their status as an insider or outsider, their location on the continuum of observer to participant and to the subjectivity of the research process (Maharaj, 2016). The field notes were seen to be particularly valuable because of the importance of the novel context of the co-production sessions spanning healthcare and higher education settings.

There are several types of field notes used in qualitative research (Neuman, 2011); types used in this research were direct observation, written immediately after the co-production sessions, and inference notes reflecting social relationships, emotions and meanings inferred from group and individual behaviour in the co-production sessions. The facilitators were requested to ask purposeful reflection questions, informed, and adapted from Deggs and Hernandez (2018):

Examining culture and norms:

- What were the norms in the co-production group?
- How would you describe the culture of the co-production group?
- Was there a display of power in the co-production group? Who controlled it?
- Did you notice the composition of the co-production group (gender, social class)?
What did it tell you about the dynamics within the co-production group?

Positionality of research subjects:

- What roles did people play?
- Were there groups or sub-groups?
- Were you part of any group as the facilitator?

Positionality as a facilitator:

- How did you feel before, during and after the co-production group sessions?
- What was your vantage point as a facilitator?

- How did your vantage point impact your insight and understanding about what you observed?

4.4.4 Analysis: Acceptability questionnaire data

Descriptive statistics were reported as frequency of response choice for each question.

Due the participant group size, the acceptability data set from the co-production group was not sufficiently large to conduct inferential statistical analysis.

4.4.5 Analysis: Semi-structured interview data

Qualitative data, collected from free-text boxes on the questionnaires, from semi-structured interviews, or from reflective field notes, were thematically analysed. Thematic analysis, as described by Braun and Clarke (2006) was chosen because of the flexibility of the method in terms of sample size and constitution, research question and data collection method (Braun and Clarke, 2017). The mixed methods nature of this study included data collection by questionnaire and by interview, with some free-text boxes on the questionnaire to collect qualitative comments. Thematic analysis was appropriate for analysis of both sets of data, despite the potential differences between the data sets. Additional benefits of using thematic analysis relate to the accessibility of the method and of the results, the potential to highlight both differences and similarities across the data set, which was useful when comparing responses from students and early career nurse members, and the ability to summarise key features of the data and present the thick description of the data set (Braun and Clarke, 2006). Despite the many advantages of thematic analysis, the flexibility offers potential for inconsistency or lack of coherence when developing themes as the researcher becomes the instrument that analyses the data (Nowell, et al., 2017). This was acknowledged and mitigated to some extent by collaborative analysis across the research team.

Qualitative data analysis followed the six phases of thematic analysis: 1) Familiarisation with the data; 2) Generation of initial codes; 3) Searching for themes; 4) Reviewing themes; 5) Defining and naming themes; and 6) Producing a report (Braun and Clarke, 2006). For the

analysis to meet Lincoln and Guba's (1985) concept of trustworthiness, steps were incorporated as indicated in Table 7 (adapted from Nowell, et al., 2017).

The concept of rigour was considered and detail of how credibility, transferability, dependability, and confirmability were incorporated into the design of the study are given in Table 15, Chapter 5, section 5.2.8.

4.5 Phase 1 results

The co-production process was undertaken between April 2018 and July 2018. The co-production group met six times between April and July 2018 and consisted of 12 members, two male and ten female, two early career nurses and ten nursing students, eight of whom attended regularly. Despite several repeated attempts to recruit early career nurses to take part in the study, this proved difficult, however the two who did participate were committed to the study and both attended every session apart from the first and provided considerable and valuable contributions. Attendance data and questionnaire data were collected from group members and four semi-structured telephone interviews were conducted with one early career nurse and three students. Attendance data are provided in Table 10. Both group facilitators were interviewed face to face and provided reflective field notes about their experience of the process. The qualitative data were of particular benefit to provide insight and to contextualise the acceptability data. The data were analysed between December 2018 and April 2019.

Table 10 Attendance at Co-production group sessions

Number of attendees	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Early career nurses	1	2	2	2	2	2
Student nurses*	8	4	4	3	1	3
Total	9	6	6	5	3	5

* First student meeting (1a): 4 BSc Adult & 4 BSc Children's nursing students of which 2 were first year students, 1 second year student and 5 final year students. All subsequent meetings attended by final year BSc Adult students only

The emotional mapping (timeline) exercise generated comments from participants which were related to 13 areas of their journey from student to qualified nurse. The headings and a sample of the topics are presented in Table 11.

Table 11 Comments posted on the emotional mapping exercise

Highlighted area of participants' journey	Example posted comments
University placements	• University placements- nerve wracking- 9-5 first few weeks might be appropriate instead • Exhaustion due to commute and travel has been an issue for me and has led to me feeling burned out. • Pros- good that they provide a variety of placements, not just ward. Cons placements alongside assignments and exams to prepare for. It is exhausting. • Experience is variable – depends on hospital/ward/mentor • Suggestion: being more proactive and vocal in what students want to make sure they get the most out of experience – need to know how to approach people & ask for help • Opportunities for other types of placements would be good e.g. in the military – has to be sourced by the students themselves
University simulated practice	• Some skills we are not able to do as soon as we qualify so by the time are able to get it signed off as a nurse the knowledge we have forgotten • Trust should come in and do job interviews during this time • Pros- good practice- cons- do not cover the skills we need waste of time. Should be more interactive and engaging and cover skill we need for the ward • Focusing on the skills they need in practice and getting practice on placements- medicine management- phlebotomy – iv therapy – cannulation
University final assessments	• Coursework would be better when it is not during placement as it is exhausting and difficult • Ensuring from start of 3rd year- students are made aware of different pathways available for them to follow • Student nurses should be given management sessions, so they know how to manage their placements and final assessments
Job applications and interviews/career information	• Not enough practice from university. We are given only 1 mock interview • Fear of not receiving a job offer by the time we qualify • Difficult to get a sense of the job roles available as a student e.g. corporate nurse, ward nurse etc

	• RCN holds conferences – this is a good source of information • Suggestion: a careers session where nurses in different roles come to talk about what they do
Registered nurse: first few weeks	• Fear of being unsupported and left in the deep end • First few weeks as a RN, - anxious – doing skills that you haven't done before- support from staff • Professional Development Nurses (PDNs) for each department are a key contact for newly qualified – can buddy with you for a few shifts
Registered nurse: first medication round	• Should be done as early as possible to be efficient • Do not have enough medication practice. Have to rely on other nurses which annoys them and takes their time away. No training for meds when you graduate even basic ones.
Registered nurse: deaths and errors	• Having sessions for both students and qualified nurses to help deal with stress. • If nurses make an error, they should be supported through it, rather than getting told off about it, or looked down on because of it. In case of death nurses should be supported, maybe through counselling as it can have a serious emotional & psychological effect. • Need a manager who is understanding to help you deal with these issues • Need to have a proper debrief afterwards – can be variable, depending on if you have a good consultant/registrar
Preceptorship	• Working with another mentor for a longer period of time. • I think preceptorship programme should be offered from the university of qualification as it would continuation of education's style • Not enough information given by uni. • During the preceptorship, you look at Gibb's model of reflection (to help reflect on what happened during the day) but this training could be better e.g. how to use the model in practice
Live events that impact on work	• Getting married and having a baby will result in difficulty doing the long hours, no flexibility. No help from workplace to accommodate your change in circumstance. • Should be provided with counselling or one to one session where they can speak about life events that are affecting them and their ability to work and be given advice or plans how they can manage it. • Life events - has had a major toll on my practice- uni are supporting however I feel I have not had this support on placements- I ended up contacting the university as opposed to other members of staff, this is because I don't feel comfortable and do not know how they will react.
Wellbeing at work	• Stress - no one to speak to or get support from, everyone is dealing with their own issues, no meeting with staff to help manage workload. • Being able to talk to someone during work when things get tough or difficult.

	- Working conditions- give flexible working hours. Shorter days should be offered in more places. The resting period should be longer and all nurses should have allocated resting time, management should spend more time working on the ground providing support - Need to be able to go home with a clear conscience that you didn't make a mistake and being able to switch off from work – these are part of the job.
Working conditions	- Working conditions- more shorted shifts and more breaks - The team has a major impact on the working experience. Conflict across teams leads to an unpleasant experience - Flexibility in hours- utilising staff who can only work certain hours in other departments. - Encourage staff to get to know one another, good teamwork makes working conditions better. Communication is key - More autonomy as a nurse with greater responsibility (can't just rely on others anymore)
Training once qualified	- Have more time when working but need to make sure you are up to date - Training needs to be more accessible e.g. at home, online
NHS internal systems	- Difficulty with IT systems - eShare on Barts intranet – really good source of info but can be difficult to access - Issues with access cards not working so can't access key services - Need to know who to contact to deal with these issues

Through engaging with the subsequent steps of the accelerated EBCD process, the co-production group worked together to form a consensus about which of the areas identified in Table 11 should be the focus of the intervention. Although the number of students in attendance was greater than early career nurses, the extended experience that the early career nurses could share served to moderate the views and perspectives of the students, resulting in a balanced and democratic approach to content development. Facilitators were also aware of the importance of a shared space where each participant had the opportunity to speak. The group then proposed solutions (illustrated in Figure 11 and 12) that were used to collectively designed an intervention that consisted of four additional days of interactive learning, which were incorporated into the final year of the nursing curricula. The educational format of the intervention was the preference of the co-production group and not specified by the facilitators, although the educational setting for the group meetings, and the experience of the participants as students may have been influential. The content of

the days was collaboratively finalised by the group members at the final meeting. An example of their work is illustrated in Figure 12.

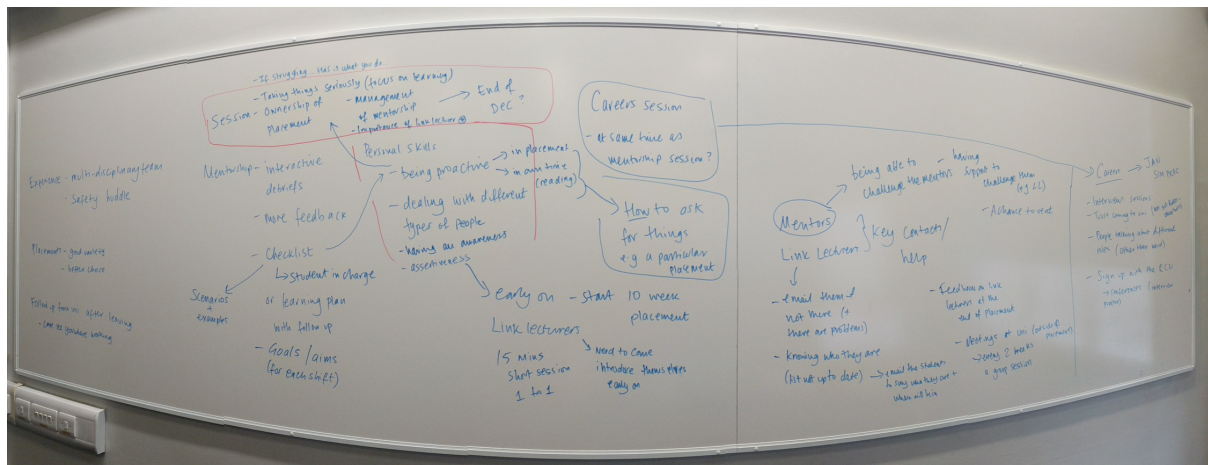


Figure 11 Photograph of the solutions posed by the co-production group

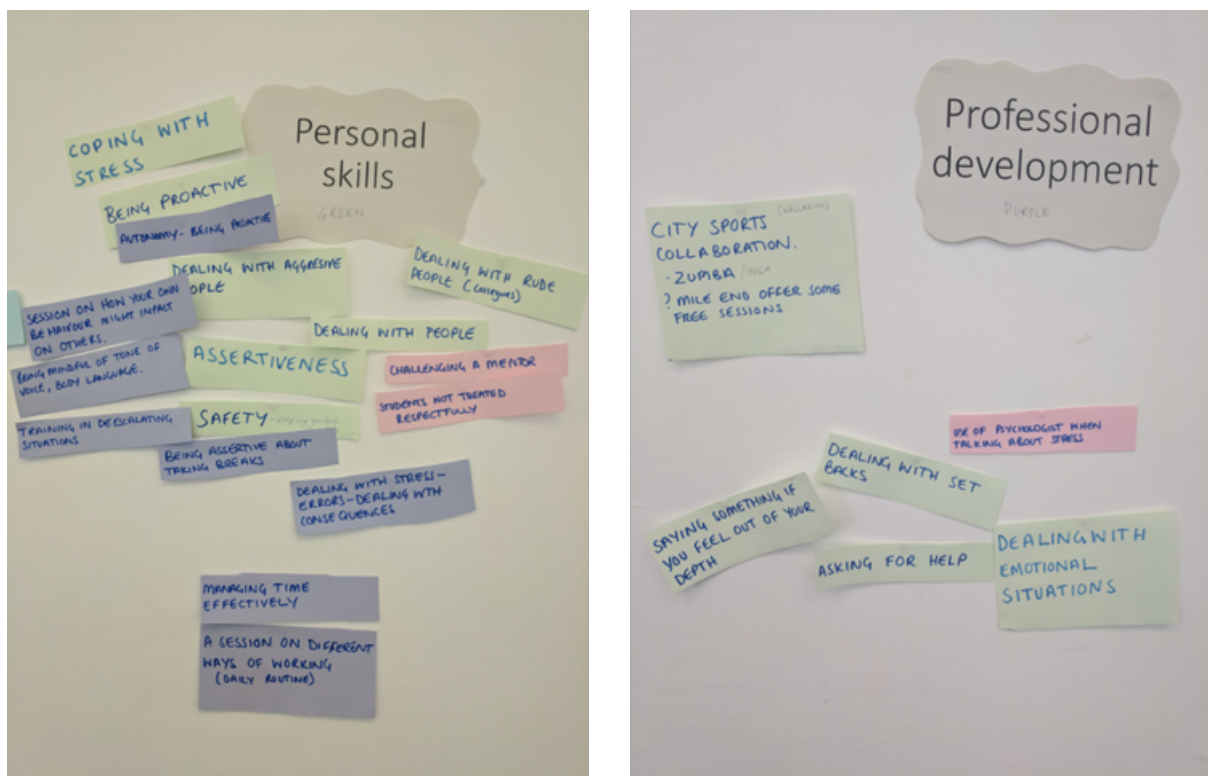


Figure 12 Example of suggestions by the co-production group for intervention content

The facilitators arranged the content of the planned intervention into interactive learning sessions, liaising with the co-production group members by email to check that their

interpretation of the group outcomes was accurate. The final content of the intervention was as follows and is illustrated in Table 12, which shows the distribution of sessions across the four additional days:

- Acceptance and commitment therapy
- Developing social networks
- Assertiveness and dealing with difficult behaviour
- Time management
- Coping with stress
- Question and answer sessions with early career nurses
- Drop-in sessions to discuss practice issues

Table 12 Programme of activity for the intervention

	Day 1	Day 2	Day 3	Day 4
Morning 3-hour session	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)
Afternoon 2-hour session	Time management interactive workshop	Developing social networks interactive workshop and Q&A with early career nurses	Assertiveness, dealing with difficult behaviour interactive workshop	Coping with stress interactive workshop
Afternoon 1-hour session	Reflective discussion about practice related issues	Reflective discussion about practice related issues	Reflective discussion about practice related issues	Reflective discussion about practice related issues

4.6 Integration of data

The quantitative and qualitative findings were integrated to support the explanatory nature of the study. Quantitative questionnaire data were initially collected, and follow-up qualitative interviews were conducted to contextualise the questionnaire data. The findings are presented as a joint display table to demonstrate how the interview data helped to explain the acceptability questionnaire data (Table 13).

Table 13 Joint Display of Results from Phase 1 of the Study

Quantitative Results from Acceptability scores	Qualitative follow-up interviews explaining quantitative results	How Qualitative findings helped explain quantitative results
Affective Attitude - Participants increased their agreement over time that the co-production process was enjoyable.	Attending the group meetings was not perceived to be onerous but was positive and enjoyable; participants cited interest in hearing other people's opinions and the outcome of the intervention implementation. Only one group member reported that they felt their opinions were not valued by the facilitators and stopped attending the group meetings. The co-production meetings were mutually beneficial; students learned from early career nurses and early career nurses enjoyed the opportunity to reconnect with the students.	The perceived personal gain from the process contributed to the enthusiastic response from those interviewed. This included an increased sense of self-efficacy and self-worth because at the end of the process they believed they were able to make a difference, help future generations of nurses, and develop communication and problem-solving skills useful for clinical practice. They also understood the capital that they brought to co-production.
Burden – group members anticipated that participating in co-production would take effort but by the final session indicated they disagreed or strongly disagreed that co-production required effort.	Attending the group meetings was not perceived to be onerous but was positive and enjoyable.	Once group members understood the concept of coproduction, the level of burden was perceived to be more acceptable and group members found ways to overcome the practical barriers to engagement. This suggests that clearer explanation, with examples of similar processes, at an earlier point would enhance the process.
Ethicality - Participants increased their agreement over time that the co-production was a process they personally valued.	All group members and facilitators stated that they would engage with the process again. In one instance a group member felt undervalued and unrepresented and chose to leave the group.	The facilitators struggled with the tension between allowing the group members time to benefit from the process and meeting the aim of the project. They had to juggle ethical and political complexity, which was for the most part effective.
Intervention coherence - Participants increased their agreement over time that they understood the co-production process	As understanding about the process increased, so did the confidence of the participants that they could contribute, and that the process was effective. The facilitators were challenged by the use of the group as a therapeutic space. They reported regularly guiding the focus of the group back to the narrow parameters of the terms of reference, possibly in juxtaposition to the collaborative nature of co-production. The academic setting for meetings may have been an additional constraint to achieving the full potential of the process.	Those interviewed explained how they came to understand the co-production process, value their own and others' contributions over time, and took the opportunity to gain personally from the experience, which impacted on their perception of opportunity costs. The distribution of knowledge and expertise across organisations and the significance of context in co-production is key.

Opportunity costs - group members anticipated that participating in co-production would interfere with other priorities but by the final session indicated they disagreed or strongly disagreed that co-production interfered with their other priorities.	Participants felt there were unanticipated benefits to participating in a co-production group, both for the facilitators and the group members. These benefits were founded in their experience, specifically being part of a group and making a difference, developing transferrable skills, and enhanced health and wellbeing.	Co-production is not without cost; it is emotionally demanding and subject to competing demands and expectations. However, co-production has the potential to offer unanticipated added value beyond that of the design of an intervention, both for group members and facilitators and for the integrity of the output.
Perceived effectiveness - Participants increased their agreement over time that the co-production process was an effective way to design an intervention.	Participants saw the strength of co-production as the integrity of the product, derived from the ideas and experiences of the group. The facilitators highlighted that co-production encouraged group members to be proactive; they were stimulated to think in a different way to develop the intervention.	The perception that the process was effective developed in parallel with participants recognising their developing skills and appreciating the opportunity to help future generations of nurses.
Self-efficacy - Participants increased their agreement over time that they could contribute to the co-production process.	Group members and facilitators both stated that they would engage with the process again. Three of the group members identified that helping the next generation of nurses was both a motivation to take part and a positive outcome of co-production. Both facilitators and group members reported that they had developed new skills during the co-production process.	Their comments identified that they enjoyed hearing others' experiences, and this increased their self-efficacy as they gained confidence with their own practice.

4.7 Publication 2: Co-Production of an Intervention to Increase Retention of Early Career Nurses: Acceptability and Feasibility

The process and findings from the evaluation were written as a paper, which was published in the journal Nurse Education in Practice. This international journal had an impact factor of 1.614 in 2020. Peer review of the paper was conducted by two individuals, one being the journal editor. The feedback from the journal editor was positive: “It is one of the most innovative research topics I have reviewed in a while” and the editor indicated that the content was both challenging and interesting, with clear relevance for current clinical contexts. The paper as published has been included in this chapter.

4.7.1 Declaration of contribution to the development of the paper

The development of the paper was led by me (JB) as PhD student, with feedback from supervisors to ensure that the reporting was of the highest standard. JB wrote the drafts of the paper for publication and prepared the paper for submission to the journal. LA, DS and JM were involved in the review of the drafts and gave advice about revisions.

4.7.2 Declaration form



STATEMENT OF CO-AUTHORS of JOINT PUBLICATIONS

TO WHOM IT MAY CONCERN

Title of publication: Co-Production of an Intervention to Increase Retention of Early Career Nurses: Acceptability and Feasibility

Name of candidate: Judy Brook

Title of thesis: Development and implementation of an intervention to increase retention and decrease burnout of early career nurses

Name of first supervisor: Professor Leanne Aitken

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

Signature:

Name: Judy Brook

Date: 26.10.2020

Signature:

Name: Leanne Aitken

Date: 07.04.2021

Signature:

Name: Julie MacLaren

Date: 01.05.2021

Signature:

Name: Debra Salmon

Date: 21st April, 2021

Statement indicating the candidate's contribution to the publication

This statement is written in accordance with the Contributor Roles Taxonomy (CRediT) as this is now commonly required during the submission process and published with the paper.

Judy Brook: Conceptualisation, methodology, validation, analysis, data curation, investigation, writing – original draft, writing – review and editing, visualisation, project administration, funding acquisition.

Leanne Aitken: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Julie MacLaren: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Debra Salmon: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

4.7.3 Published paper

CO-PRODUCTION OF AN INTERVENTION TO INCREASE RETENTION OF EARLY CAREER NURSES: ACCEPTABILITY AND FEASIBILITY

Judy Brook^a, Professor Leanne M. Aitken^a, Dr Julie-Ann MacLaren^a and Professor Debra Salmon^a

- **Acknowledgments**

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- **Declarations of interest statement**

Declarations of interest: none

- **Funding Statement**

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Doctorate Studies

Co-production of an intervention to increase retention of early career nurses: Acceptability and feasibility

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Keywords:

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ABSTRACT

Co-production is a process employed to solve complex issues, recognising the expertise of all stakeholders. This paper reports on co-production undertaken by nursing students, early career nurses and researchers as part of a larger study to design an intervention to increase retention of early career nurses. Mixed methods were used to evaluate the acceptability and feasibility of the co-production process in a UK university.

Data were collected prospectively, concurrently and retrospectively via interview and questionnaire, between April 2018 and January 2019.

Twelve co-production group members completed the questionnaire and six group members and facilitators were interviewed. Students and early career nurses reported personal benefit from participating; they developed and practised transferrable communication and problem-solving skills, believed they were able to make a difference, enjoyed contributing, found benefit from using the group as a reflective space and considered that co-production produced a credible intervention.

Findings indicated co-production equipped participants to function more effectively in their nursing roles; incorporating co-production into the development of future interventions may prove beneficial. The relative novelty of this approach, and the potential application of the findings to a diverse range of geographical and organisational settings, add to the utility of the findings.

1. Introduction

The nursing workforce is a national and global priority, highlighting the importance of identifying reliable ways to encourage nurses to remain in their role and in the profession. The extent and impact of nurse turnover has been discussed extensively in the nursing literature as it affects many countries' ability to fight disease and improve health. In England, more than 1 in 10 registered nursing posts in the NHS are vacant (Beech et al., 2019), and international research indicates that on average 10% of the nursing workforce seriously considers leaving either their current role or the profession (Heinen et al., 2013). The issue of retention is particularly topical in the wake of the COVID-19 pandemic, which has shone a spotlight on the importance of a sufficient and robust nursing workforce.

Although current nurse workforce issues are particularly acute, this is not a new concern and the international nursing literature is replete with examples of initiatives to reduce turnover and increase retention in high and medium-income economies. A large systematic review (Brook

et al., 2018) explored interventions to increase retention and decrease turnover of early career nurses in a range of settings. Whilst a wide range of interventions were reviewed, many studies showed limited and inconsistent benefits. The review highlighted a paucity of evidence relating to the explicit participatory nature of work to design interventions to increase retention of nurses. What was missing from these studies was the voice of students and early career nurses regarding potentially beneficial solutions.

The increasingly popular approach of co-production is one way to access and incorporate those voices. Traditionally developed in relation to service improvement (Osbourne et al., 2016), co-production has been embraced as the cornerstone of public policy reform (Home and Shirley, 2009) and is now referenced prolifically in grey, policy-orientated literature. In particular, the value of service user involvement in creating health services that are fit for purpose is increasingly recognised in UK policy (Potter et al., 2015) and mirrored in expectations of higher education institution healthcare programme development and delivery (Quality Assurance Agency for Higher Education, 2018;

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Nursing and Midwifery Council, 2018). The underpinning premise of co-production is that working in partnership results in more relevant, appropriate and sensitive outputs (Latif et al., 2017). Working with nurses and students to develop an intervention that aims to increase retention of nurses is more likely to result in a pragmatic and credible intervention (Henshall et al., 2018), that may also be more effective.

This paper reports on a co-production process undertaken by nursing students, early career nurses and researchers as part of a larger study to design an intervention to increase retention and decrease burnout of early career nurses. Those individuals potentially impacted by attrition from the nursing profession were key to the process, offering greater understanding of the value of co-production in similar future intervention development. The co-production approach used to design the intervention spanned both healthcare and higher education contexts. The relative novelty of this approach, and the potential application of the findings to a diverse range of geographical and organisational settings, add to the utility of the findings.

1.1. Background

There is no consistent definition in the literature but (Durose et al., 2017, P135) describe co-production as 'joint working between people or groups who have traditionally been separated into categories of user and producer'.

Co-production originated in public service administration, with recognition that drawing on the expertise of a plurality of actors was a practical and reinvigorating solution to complex problems (Sorrentino et al., 2016). Whilst the construct of co-production is continually evolving (Sorrentino et al., 2018), the benefits outlined in the wider literature such as more sustainable change, greater translation of knowledge into practice and closing the theory-practice gap (Durose et al., 2011), are of relevance to clinical and higher education contexts. Although there is an inevitable blurring of boundaries, co-production differs from participatory research, which often seeks to disrupt the traditional power relationships and distinction between researcher and the researched (Higginbottom and Liampittong, 2017). Co-production focuses on a commitment to working together, recognising the equity of all forms of knowledge, and the social capital of the participants (Voorberg et al., 2015). Participants in co-production recognise that although different parties may require different outcomes from the process, undertaking the journey together will result in a jointly owned product (Hickey, 2018). The shared experience may also leave a more enduring and beneficial legacy than traditional forms of service development.

Whilst co-production is a relatively new phenomenon in health education contexts, it promises to allow students as co-production group members to evolve beyond passive receivers of knowledge. A recognised challenge is the paradigm shift that students must undertake to see themselves as co-producers rather than participants (Vargo and Lush, 2004) and acknowledge the capital they bring in terms of experience and perspective.

Despite the importance that policy makers attach to co-production, a systematic review (Voorberg et al., 2015) identified a dearth of studies that addressed the outcomes and concluded that the process is primarily seen as a virtue in itself, with few external objectives given to legitimise the choice of process. Potential achievable objectives included increased effectiveness, efficiency, and service user satisfaction. Challenges included lack of awareness about co-production, preconceptions about service users' ability to co-produce, service and time constraints, and developing, managing and utilising sometimes tense partnerships (Holland-Hart et al., 2019). Ultimately, knowledge is scarce about how co-production works in practice, in what context it is best utilised, or whether it is a superior approach to alternatives (Oliver et al., 2019).

This study evaluates the feasibility and acceptability of the co-production process, in order to gain insight into the value and utility of the process of co-production to the stakeholders and project

objectives. The co-production group was facilitated by two researchers employed by a UK university and six group meetings were held in the university during spring 2018. The established co-production toolkit, Experience Based Co-design (EBCD), was used to guide the process (Point of Care Foundation, 2016). The toolkit consists of specified exercises and steps, which were implemented as described in Table 1.

2. Methods

Aims: The aim of the study was to implement and evaluate the co-production of an intervention to increase retention of early career nurses. The focus of the evaluation was to explore the experiences of the co-production group members and facilitators, their perceptions of the acceptability of co-production as a process, and the feasibility and value of co-production within the context of nursing and education.

Design: Using an overall evaluation research methodology, an explanatory sequential design was undertaken using mixed methods to provide a comprehensive view of the co-production process. A questionnaire was used to collect data on acceptability of the co-production process, followed by semi structured interviews with group members and facilitators, and reflective field notes, to explain and add context to the questionnaire data.

Sample/Participants: A purposive sample of all members and facilitators of the co-production group were invited to participate in the study. This included students undertaking adult or child pre-registration nursing programmes at a UK university, who were completing their placements at a specific partner NHS organisation, and early career nurses (within their first year following registration) working at the collaborating NHS organisation. Students were recruited to the co-production group from existing pre-registration nursing programmes and the early career nurses were identified through the preceptorship programme at the NHS organisation. All participants attended at least one co-production group session. The two facilitators were employed by the university as researchers, one was jointly employed by the NHS organisation as an early career nurse.

2.1. Data collection

The mixed methods approach incorporated three data collection methods: questionnaire data collection, semi structured interviews and reflective field notes.

Questionnaire data: Acceptability questionnaires based on the

Table 1
The Co-production process using Experience Based Co-design (EBCD).

Step	Activity
1	An early career nurse and research fellow were recruited to work together to facilitate the co-production group process.
2	Literature and archive film were searched to gain an understanding of what was happening in relation to early career nurse retention.
3	Staff from a partnership NHS organisation and staff from the university were interviewed about their experiences and opinions of early career nurse retention. Interviews were recorded on film, and archive film was collated.
4	The film was edited to incorporate new footage and archive footage, resulting in a 30-min film of themed chapters outlining the issues and evidence base.
5	Early career nurses and student nurses were invited to participate in the co-production group.
6	An early career nurse feedback event was held where the film was shown to stimulate discussion. Areas to focus on for intervention development were discussed.
7	A student feedback event was held where the film was shown to stimulate discussion. Areas to focus on for intervention development were discussed.
8	A joint student-early career nurse event was held to share experiences and agree areas for focus and further discussion to develop the intervention.
9	The co-production group met on 6 occasions over 3 months to develop the intervention, facilitated by the research fellow and early career nurse.
10	Once finalised, the intervention was shared with wider study team for comment and preparation for implementation.

theoretical framework of acceptability (TFA) of healthcare interventions (Sekhon et al., 2017) were developed. The TFA comprises of seven constructs (Fig. 1). To evaluate acceptability, questions related to the seven constructs in the model and used a likert-type scale to collect data. Questionnaires were completed between April and June 2018, to explore changes over the duration of the co-production process. Question phrasing was changed for each data collection point to reflect the temporal nature of the process. The complete questionnaire is available as Supplementary Table 1, however, an example of the temporality can be seen in Question 6, relating to the construct of opportunity costs:

Time point 1: Participating in this co-production group will interfere with my other priorities.

Time point 2: Participating in this co-production group is interfering with my other priorities.

Time point 3: Participating in this co-production group interfered with my other priorities.

Semi-structured interviews: interviews were conducted between December 2018 and March 2019 and explored experience of the process, including the challenges, benefits, and perceived effectiveness as a method for developing an intervention to increase nurse retention. Interviews with the co-production group members were conducted by telephone by a female academic researcher (JB) independent to the co-production process but integral to the larger project. Interviews with facilitators were conducted face-to-face by another independent female researcher (GL), who had no prior relationship with the facilitators or project.

Reflective field notes: Group facilitators provided reflective notes about their experience of the co-production group sessions, particularly how they felt as facilitators, what went well, what was challenging and how the process could have been improved.

Ethical considerations: Ethical approval was gained from the University Research Ethics Committee (reference: Staff/17-18/18), the Health Research Authority (21.06.18: IRAS ID: 245992) and by the collaborating NHS Trust Research and Development (02.07.18: R&D No: 012400) with respect to research capacity. Specific consideration was given to the voluntary nature of participation, the need for informed consent and respecting the anonymity of the participants.

2.2. Data analysis

Questionnaire data: descriptive statistics were reported as frequency of response choice for each question.

Semi-structured interview data and reflective field notes: thematic analysis followed the six phases outlined by Braun and Clarke (2006). The field notes and interview were integrated during analysis. Reflective field notes, facilitator and group member interview data were given equal weighting during analysis.

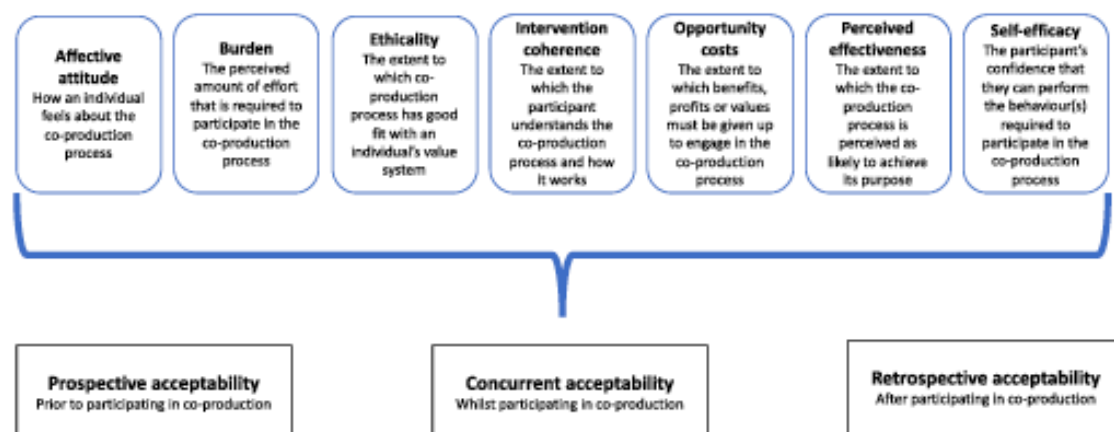
Validity and reliability/Rigour: The questionnaire was based on the TFA. The multi-component framework allows identification of the source of an acceptability issue and easier refinement of the co-production process (Sekhon et al., 2017). The questions were tested for both content and construct validity and amended to improve clarity and validity. Social desirability bias was mitigated through self-administration of the questionnaire and reassurance that answers would be kept confidential.

The interview guide was formulated following analysis of questionnaire data and decisions about which aspects required further explanation. One interviewer was a nurse (JB) and therefore had insight into the professional context of the group members, and one (GL) was an experienced social researcher and educator. Although there are some limitations to telephone interviews, such as not being able to read visual cues through body language, they were used as a pragmatic solution to contacting the geographically dispersed group members. The research team were reassured that the interviews elicited rich descriptions of the participants' experiences.

Quantitative data analysis: was conducted using SPSS version 25. Qualitative data analysis was conducted by two researchers independent to the co-production group. Each researcher analysed the qualitative data independently, themes and ideas were discussed, agreed and presented to one early career nurse from the co-production group for comment, who attended a steering group meeting for the wider project, and who agreed that the findings represented their experience of the process.

3. Results/findings

The co-production group consisted of 12 members, two male and 10 female. Two members were early career nurses and 10 were student nurses; 2 in the first year of their programme, 1 in the second year and 7 in the final year. The co-production group met 6 times with an average attendance of 5 members (maximum 8, minimum 3). First and second year students attended only the first meeting.



Acceptability as defined by Sekhon et al 2017: A multi faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experiential cognitive and emotional responses to the intervention.

Fig. 1. The Theoretical Framework of Acceptability (Sekhon et al., 2017), adapted to illustrate the seven constructs in relation to co-production.

3.1. Acceptability questionnaires

Twenty-three acceptability questionnaires were completed, 12 at the beginning, 6 at mid-point and 5 at end point (Table 2).

Participants were generally positive about the co-production process. Greatest change over time related to the constructs of burden (Q3) and opportunity costs (Q6) with respondents anticipating that participating in the co-production group would take effort and would interfere with other priorities. By the final session, participants indicated they disagreed or strongly disagreed that co-production required effort or interfered with their other priorities.

Participants increased their agreement over time that the co-production process was enjoyable (Q2), an effective way to develop the intervention (Q4), a process they personally valued (Q5), they were confident they could contribute (Q7), and they understood the process (Q8). The semi-structured interviews were used to explore the acceptability in greater depth, particularly around the constructs of affective attitude, burden and effectiveness of co-production.

3.2. Semi-structured interviews

Telephone interviews were carried out with 4 co-production group members; 1 early career nurse and 3 final-year students, who had

qualified as nurses subsequent to the co-production group meetings. Face-to-face interviews were conducted with the group facilitators.

Thematic analysis of the interviews and the reflective field notes of the facilitators identified two overarching themes: co-production as a framework or philosophy, and the added value of co-production. The relationship between themes and subthemes is illustrated in Fig. 2.

3.3. Co-production as a framework or philosophy

Data relating to co-production as a framework or philosophy included three subthemes: the effectiveness of co-production, being heard and being valued, and the influence of the higher education setting.

The effectiveness of co-production: facilitators and group members were unanimous in their belief in co-production as an effective method of designing an intervention. Participants saw the strength of co-production as the integrity of the end product, derived from the ideas and experiences of the group:

'Yeah, definitely because it keeps it realistic and you're able to actually gather real opinions in order to help other people because then we've been through it and so we understand so we're able to ... form a realistic intervention.' (Participant 2)

Table 2
Co-production acceptability questionnaire results by time point.

Question and TFA construct ^a	N (%)														
	Strongly disagree			Disagree			No opinion			Agree			Strongly agree		
	Start	Mid-point	End	Start	Mid-point	End	Start	Mid-point	End	Start	Mid-point	End	Start	Mid-point	End
1) I feel it is acceptable for me to take part in the co-production process (general acceptability)	0	0	0	0	0	0	0	0	0	2 (17%)	0	0	10 (83%)	6 (100%)	5 (100%)
2) I am enjoying taking part in the co-production process (affective attitude)	0	0	0	0	0	0	0	0	0	4 (33%)	1 (17%)	0	1 (17%)	5 (83%)	5 (100%)
3) It is taking effort for me to take part in the co-production process (Burden) (disagree – less effort)	0	0	2 (40%)	3 (27%)	1 (17%)	3 (60%)	4 (37%)	0	0	2 (18%)	3 (50%)	0	2 (18%)	2 (33%)	0
4) The co-production process is an effective way to design this intervention (perceived effectiveness)	0	0	0	0	0	0	0	0	0	4 (33%)	0	1 (20%)	8 (67%)	6 (100%)	4 (80%)
5) I value the co-production process as a way of designing an intervention (ethicality)	0	0	0	0	0	0	1 (8%)	0	0	6 (50%)	0	0	5 (42%)	6 (100%)	5 (100%)
6) Participating in this co-production group is interfering with my other priorities (opportunity costs) (disagree – less interference)	2 (17%)	1 (17%)	1 (20%)	8 (67%)	4 (67%)	4 (80%)	1 (8%)	0	0	0	0	0	1 (85%)	1 (17%)	0
7) I am confident that I am able to contribute to the co-production process (self-efficacy)	0	0	0	0	0	0	0	0	0	7 (58%)	2 (33%)	0	5 (42%)	4 (67%)	5 (100%)
8) I understand the co-production process and how it works (intervention coherence)	0	0	0	0	0	0	0	0	0	5 (58%)	2 (33%)	0	5 (42%)	4 (67%)	5 (100%)

^a Phrasing of questions was adapted as appropriate for the time point.

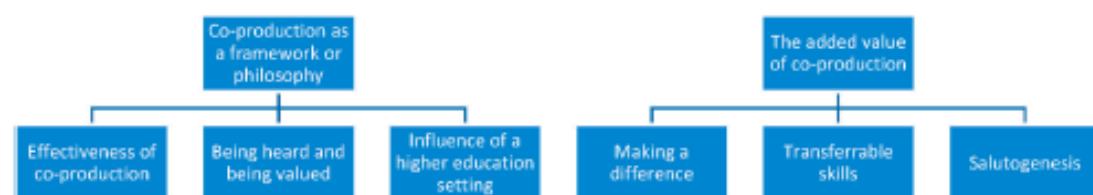


Fig. 2. Themes and sub-themes identified from the interview and field notes data.

The facilitators highlighted that co-production encouraged group members to be proactive; they were stimulated to think in a different way to develop the intervention. One group member suggested that co-production could be more effective if decision makers from partner organisations were also present as group members:

'I think if you were to bring in people with a bit more of a status in the degree programme itself, the students will be thinking, you know what this is the opportunity. They are going to be sitting across the table from me, let me just shoot them a couple of questions.' (Participant 1)

Group members and facilitators both stated that they would engage with the process again and would consider incorporating a co-production element into future research, although facilitators recognised it as a resource intensive process that may not be feasible in every research project.

Being heard and being valued: the facilitators were aware of the potential power differences between themselves as researchers, the qualified nurses and the students. Attempting to flatten this hierarchy, they integrated into the group:

'And I just felt like one of them if that makes sense which is, the main point of the co-production is that we're on the same level and there isn't any hierarchy. And I really did feel I wanted to really have a bit of a gossip with them because that was because I'd experienced it as well.' (Facilitator 1)

To a large extent this was effective, with participants reporting that they were able to talk freely, that their ideas or suggestions were welcomed and that their voices were being heard:

'They facilitated the environment where everyone ... felt comfortable opening their mouth and giving their opinion regardless of what it was. Even if it was disagreeing with something someone else might have said ... We're all adults and I'm sure we can have a good conversation about something without getting too heated.' (Participant 1)

Only one group member reported that they felt their opinions were not valued by the facilitators and stopped attending the group meetings. This group member was experiencing significant problems in clinical placement and felt it would be useful to share with the group, however the facilitators, conscious of time pressure, guided the conversation to areas they felt were more relevant to the project:

'So, my voice was being, yeah, it was being heard but when it was not being valued was when I was a bit frustrated, but yeah it was being heard.' (Participant 4)

'Eventually and after treading carefully so as not to upset anyone, we offered that we would hang around after the session to have a moan about placements but if we could focus on solutions and interventions for now as we didn't want to run over time.' (Field notes 28.06.18)

The facilitators acknowledged the process would have been very different had they not felt the need to focus on outputs, and this brought into sharp focus conversations that were perceived as not solution

focused, inefficient, or going off topic. Not being in a position to 'fix' the issues in the way they would in their roles as academic or nurse, was one of the most difficult aspects of co-production.

The influence of the higher education setting: the facilitators attempted to minimise the impact of the higher education context on the process but acknowledged that as the meetings took place in a university, inevitably, the students associated them with learning. Both facilitators were tempted to resort to established techniques when working with the group members and language closely related to academic roles rather than co-production was evident in their interviews:

'That's something that I was quite aware of, is trying not to be too lecturey, it's really, really hard though because ... I'm used to the structure ... I'm used to being in charge, I'm used to talking a lot.' (Facilitator 2)

By the final group meeting the facilitators found a balance between their academic style and the philosophy underpinning co-production, encouraging group members to leave their desks, accepting the free-flow nature of the discussions and abandoning any attempts to encourage written exercises.

3.4. The added value of co-production

Participants felt there were unanticipated benefits to participating in a co-production group, both for the facilitators and the group members. These benefits were founded in their experience, specifically being part of a group and making a difference, developing transferrable skills, and enhanced health and wellbeing. This led to the conclusion that co-production was a salutogenic model, an approach that supports the relationship between health, stress and coping.

Making a difference: this was key to both facilitator and group member experience, as three of the group members also identified that helping the next generation of nurses was both a motivation to take part and a positive outcome of co-production:

'I felt like that was a chance for us to speak out about some things that might be, that could help other people, other students, not go through the same thing, if that makes sense?' (Participant 2)

The co-production meetings were mutually beneficial; students learned from early career nurses and early career nurses enjoyed the opportunity to reconnect with the students. Attending the group meetings was not perceived to be onerous, but were positive and enjoyable; participants cited interest in hearing other people's opinions and the outcome of the intervention implementation.

Transferrable skills: both facilitators and group members reported that they had developed new skills during the co-production process. Facilitators enhanced their group work skills, gaining confidence in working closely with students, and facilitating co-production:

'I think actually running the coproduction groups helped with the listening, not interjecting, going with the flow, it's OK if it doesn't go according to plan, which it hasn't done many times, that sort of thing I think has been helpful from it.' (Facilitator 2)

The group members identified that they had developed skills that they could use in their clinical roles, such as problem solving or thinking

outside the box. They appreciated others' opinions and the value of sharing ideas to reach a consensus or solution. In particular several group members identified enhanced communication skills allowing them to relate more effectively to patients:

'Storming, just considering everybody's ideas. Although we use the same language, we use it differently to articulate ourselves and sometimes it's lost in translation and sometimes you just have to hear with a different ear ... it's not just about hearing what your patient's saying, it's about hearing what they're not saying as well.' (Participant 4)

Salutogenesis: comments from participants indicated that the experience of participating in a co-production process may in itself support psychological health and wellbeing, which is the essence of the concept of salutogenesis. They identified the value of sharing issues from clinical placement, validating their feelings and being reassured they were not alone with their experiences. The opportunity to voice their concerns and hear them interpreted from alternative perspectives was cathartic. One group member felt strongly that sharing personal challenges in clinical placement was central to the group's remit:

'It was just I was going through personal issues within my placement, like I said, and I thought ... if I voiced them in the coproduction, it could have been something that can help other people.' (Participant 4)

The facilitators were challenged by the use of the group as a therapeutic space, acutely feeling the tension between the welfare of the group members and the remit of the project. They reported regularly guiding the focus of the group back to the narrow parameters of the terms of reference, possibly in juxtaposition to the collaborative nature of co-production:

'But that was probably the worst part was saying, no we can't do that sorry ... yeah, that was horrible to do because you know that they want to talk about some things and sometimes they just want to rant about certain things.' (Facilitator 1)

The benefit to the group members of being able to discuss their current issues with empathetic and compassionately critical colleagues was not lost on the facilitators and the difficulty associated with interjecting was the issue raised most frequently by both of them.

3.5. How the qualitative data explained the questionnaire data

The questionnaire data indicated that co-production was a generally acceptable process. Perceptions changed positively over time about effort, enjoyment and opportunity costs related to co-production. As understanding about the process increased, so did the confidence of the participants that they could contribute and the process was effective.

The qualitative data was a rich source of insight into the influences at each of the temporal assessments of acceptability. The perception that the process was effective developed in parallel with participants recognising their developing skills and appreciating the opportunity to help future generations of nurses. Those interviewed explained how they came to understand the co-production process, value their own and others' contributions over time, and took the opportunity to gain personally from the experience, which impacted on their perception of opportunity costs. Their comments identified that they enjoyed hearing other's experiences and this increased their self-efficacy as they gained confidence with their own practice. The interview data also gave context to the challenges the facilitators faced trying to balance the needs of the group members with the needs of the project, how this may not always have been possible or desirable but ultimately influenced the experience of the group members.

4. Discussion

Engaging service users, students or public in the design of services or education intuitively has value, but co-production has been described as weakly conceptualised with little consensus about why we do it, what effects are being sought, or achieved (Oliver et al., 2019). This argument is compounded by the longstanding debate about the nature of knowledge and expertise (Duroose et al., 2011). This study was designed to explore the experiences and perceptions of co-production group members with regard to acceptability and feasibility of the co-production process. The findings raised key points for discussion: first, the co-production process was generally acceptable and group members were unanimous in the opinion that they would like to participate in co-production again. Second, co-production in a higher education setting presented challenges related to group members' perceptions and relationships that impacted on the feasibility of co-production to design an intervention. Third, co-production has the potential to offer unanticipated added value beyond that of the design of an intervention, both for group members and facilitators and for the integrity of the output.

Evaluation of acceptability identified practical challenges to participating in the co-production process. Resources and time restraints are recognised barriers to co-production (Holland-Hart et al., 2019; Oliver et al., 2019) and all data sets revealed concern about competing priorities. Once group members understood the concept of coproduction, the level of burden was perceived to be more acceptable and group members found ways to overcome the practical barriers to engagement. This suggests that clearer explanation, with examples of similar processes, at an earlier point would enhance the process.

The academic setting for meetings may have been an additional constraint to achieving the full potential of the process. The high value placed on academic knowledge influences both the degree of control taken by academics in collaborative partnerships and the likelihood of challenge to that decision-making offered by other stakeholders (McCabe et al., 2016), exacerbated in this case by the traditional student-academic hierarchy. Potentially, respectful relationships masked the limitations this imposed. Incongruence between the social boundaries of academic/researcher/facilitator, early career nurse and student in an academic institution may in reality prevent the blurring of boundaries that is espoused as key to the co-production process (Kirkgaard and Anderson, 2018). The distribution of knowledge and expertise across organisations and the significance of context in co-production is key (Ledger and Slade, 2015).

The facilitators struggled with the tension between allowing the group members time to benefit from the process and meeting the aim of the project. Co-production is not without cost; it is emotionally demanding and subject to competing demands and expectations. The skills required to manage co-production group dynamics may differ from those traditionally required or rewarded by higher education institutions (Flinders et al., 2016). Ideally, co-production offers equality and lack of hierarchy but in reality the demands of different stakeholders impact on the ability of the facilitators to value all contributions equally or to invest time in relationships and conversations that may not have guaranteed output (Oliver et al., 2019). These findings indicate that the pressure to design an intervention weighed heavily on the facilitators, potentially exacerbated by their awareness of and engagement in the evaluation of the co-production process. They juggled ethical and political complexity and tried to design an intervention that was 'right' for all stakeholders but found it impossible to utilise all the ideas from the group. In one instance this resulted in a group member feeling undervalued and unrepresented, a recognised potential cost to co-production (Boaz et al., 2018).

One explanation for the enthusiastic response from those interviewed may be their perceived personal gain from the process; an increased sense of self-efficacy and self-worth because at the end of the process they believed they were able to make a difference, help future generations of nurses, and develop communication and problem-solving

skills useful for clinical practice. Crucially, they also understood the capital that they brought to co-production. The salutogenic nature of co-production is echoed in studies considering the benefits for service user involvement in participatory nursing research, with key contributory factors being the leadership of the process, clarification about their role, the structure of the meetings and being a member of a team (Mjssund et al., 2018). The appreciation group members had of the facilitators' styles justifies their commitment to respectful engagement (Plicker and Nixon, 2015) and genuine respect for group member opinions (Simpson et al., 2014). Given that the co-production process was implemented to design an intervention that would support newly qualified nurses, the benefit of using a salutogenic approach, maximising the potential of the relationship between health, stress and coping, was not lost. This approach has potential to be of particular value during periods of increased demand such as the current COVID-19 pandemic. In England, nursing student experience has been impacted considerably by their early incorporation into the nursing workforce and will influence their experiences as newly qualified nurses.

4.1. Strengths and limitations

The strength of this study lies in the novel approach to co-production, spanning boundaries between nursing practice and higher education. To our knowledge this is the first use of co-production to design this type of intervention making the findings relevant to a range of settings. The study represented all participant voices, offering a comprehensive perspective.

The mixed methods, explanatory sequential design further strengthens the credibility of the findings as the interview data contextualises the questionnaire data. We saw from the questionnaire data that the process became more acceptable to group members over time but that attendance was challenging. The use of interviews allowed us to triangulate with the questionnaire data and explore the context, which added significant value to the evaluation of the process. Providing opportunities for the facilitators and group members to reflect both during and after the process aligned with the principles of co-production, which advocate hearing and valuing multiple voices.

A potential limitation to the co-production process and the evaluation is the small number of participants. Although all group members attending the initial, mid-point and final group sessions completed the acceptability questionnaire, fewer attended the final group meeting. Those who found participation difficult may have decided not to continue to attend and may have had different views of acceptability of the co-production process than those who did attend, however, the interview data helped to explain the context of the lower attendance.

Ultimately, we were interested in the potential of co-production as an effective process at the interface between clinical and higher education settings. Our findings were limited by the scope of the study, as we are unable to report on the legacy of participants' experience in relation to their professional practice. We would recommend further research to explore this area.

5. Conclusion

Co-production is a technique that attempts to include individuals not traditionally seen as 'experts' in the development of services or products. Our evaluation of this co-production process highlighted the potential for greater use of the strategy in the context of higher education and clinical nursing practice. Not only was an intervention designed using co-production, but the individual nurses and students who participated gained personally from the process and saw the end product as more credible. They developed and practised communication and problem-solving skills that transferred effectively to the clinical environment. They recognised and enjoyed being able to make a difference and found benefit from using the group as a reflective space. This added value of co-production has equipped and motivated the group members to

function more effectively in their nursing roles and is a persuasive rationale for incorporating co-production into the development of future interventions.

The findings indicate that higher education institutes should work with clinical partners to develop capacity, knowledge and skills that would enable facilitation of co-production, including active listening, emotional literacy and understanding of power dynamics and strategies to equalise power relationships. This would acknowledge the unique advantages of this inclusive and effective process for the participants, for the end product, and for the enhancement of understanding and collaboration between the two organisations. Co-production has particular utility in relation to retention of early career nurses, as the findings indicate that inclusion of those most likely to leave the profession or their role will in itself engender a more positive perspective towards their professional activity. In the UK nursing context, commitment of early career nurses to the profession has potentially been impacted by student nurse experience during the emergency period, so it is imperative that this generation of nurses have the opportunity to work collaboratively to develop a solution.

CRedit authorship contribution statement

Judy Brooks: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Visualization, Project administration, Funding acquisition. Leanne Aitken: Conceptualization, Methodology, Validation, Writing - review & editing, Funding acquisition, Supervision. Dr Julie MacLaren: Writing - review & editing, Funding acquisition, Supervision. Debra Salmon: Conceptualization, Methodology, Validation, Writing - review & editing, Funding acquisition, Supervision.

Declarations of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nepr.2020.102861>.

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Ethical approval details

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Supplementary Table 1: Acceptability Questions for Co-Production Group – end point

Participants were asked to circle or underline the answer that best suited their opinion from the following options:				
Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5
Questions asked:				
1.	I felt it was acceptable for me to take part in the co-production process.			
2.	I enjoyed taking part in the co-production group meetings.			
3.	It required effort for me to take part in the co-production group sessions.			
4.	The co-production process was effective to design an intervention to help retain early career nurses.			
5.	I valued the co-production process as a way of designing an intervention.			
6.	Participating in this co-production group interfered with my other priorities.			
7.	I am confident that I was able to contribute to the co-production process.			
8.	I understood the co-production process and how it works.			

4.8 Phase 1: summary and conclusion

This co-production phase of the study was conducted against a backdrop of growing but still limited knowledge about co-production in higher education and nursing. Certainly, the use of it as a process to design an intervention at the interface between higher education and nursing practice was novel and the findings therefore add to the body of literature about the utility and acceptability of co-production in this context.

Of note was the finding that co-production enhanced the communication and collaborative working skills of the participants, skills that they were then able to use effectively in their clinical practise. The salutogenic properties of the co-production process offered a positive synergy between the aims of the study, the methods used and the potential outcomes. Participating in the co-production of the intervention had the potential to influence group members to stay in the profession because the process enhanced their skills, their self-efficacy, and their appreciation of their own social capital. This is entirely fitting for an intervention designed to increase retention of early career nurses and is a demonstration of a credible strategy to include the voices of early career nurses in the development of interventions to increase retention.

Chapter 5 Study Phase 2: Implementation of the intervention

The second phase of the study involved implementation of the co-designed intervention to increase retention of early career nurses at Barts Health NHS Trust. Implementation of the intervention occurred during the final year of pre-registration adult and children's nursing programmes at City, University of London.

The importance of evaluating complex healthcare interventions has been widely recognised (Craig, et al., 2008; Moore, et al., 2014) and key to successful implementation is evaluation of process (Moore, et al., 2015), with emphasis on implementation, mechanisms, and context. Contextual factors are important to evaluate as they may affect or be affected by implementation, or there may be causal mechanisms in the environment that act to sustain the status quo or accentuate effects. Participant responses to the intervention, mediators, and unexpected consequences are also important considerations as they may cause unexpected results or failure of the intervention (Shahsavari, et al., 2020). The Medical Research Council (MRC) recommends a feasibility and piloting phase following development of the intervention (Craig, et al., 2008; Skivington, et al., 2021), which allows for better understanding of the feasibility of the intervention and how the design and evaluation can be optimised. Consideration should be given to acceptability of the intervention to participants, the extent of their participation, and attrition from the study (Shahsavari, et al., 2020). The MRC guidance suggests use of qualitative and quantitative research methods to gain better understanding of the barriers and facilitators to implementation, and the experience and engagement of the participants.

Acceptability of healthcare interventions is important due to the influence that perceptions of acceptability may have on engagement with the intervention. Sekhon, et al., (2017) define acceptability as: *"a multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention"* (P1) and through a process of inductive synthesis and deductive theorising developed the Theoretical Framework of Acceptability, consisting of 7 component constructs. The framework has

been used to facilitate both quantitative and qualitative evaluation of healthcare intervention acceptability (Sekhon, et al., 2021) and was utilised in phase 1 of this study to evaluate the co-production process. More detail of the TFA can be found in Chapter 4. The creation of the TFA for use with healthcare interventions determined its appropriate use to evaluate the acceptability of the co-designed intervention from the perspective of students who experienced it.

This chapter describes the mixed methods evaluation of feasibility and acceptability that was conducted during and post implementation of the intervention. The chapter presents the methods used for phase 2 of the study, and the results, including a published paper.

5.1 Aim

Phase 2 of the study aimed to understand the experiences of nursing students and academic staff who were involved in the implementation of the intervention, with a view to identifying acceptability, and barriers and facilitators to wider implementation. Specific objectives were to:

1. To identify the barriers and facilitators to implementing the intervention.
2. To explore the experiences of students and staff during the implementation of the intervention.
3. To establish how the views of students and staff explain the measures of acceptability and feasibility of the intervention.

5.2 Phase 2 methods

An explanatory, sequential mixed methods design was used. Throughout the implementation of the intervention quantitative data were collected to assess the extent, feasibility, and acceptability of implementation. This was followed by collection of in-depth qualitative data to explain, and make sense of, the quantitative data. Figure 13 illustrates the design of phase 2 of the study.

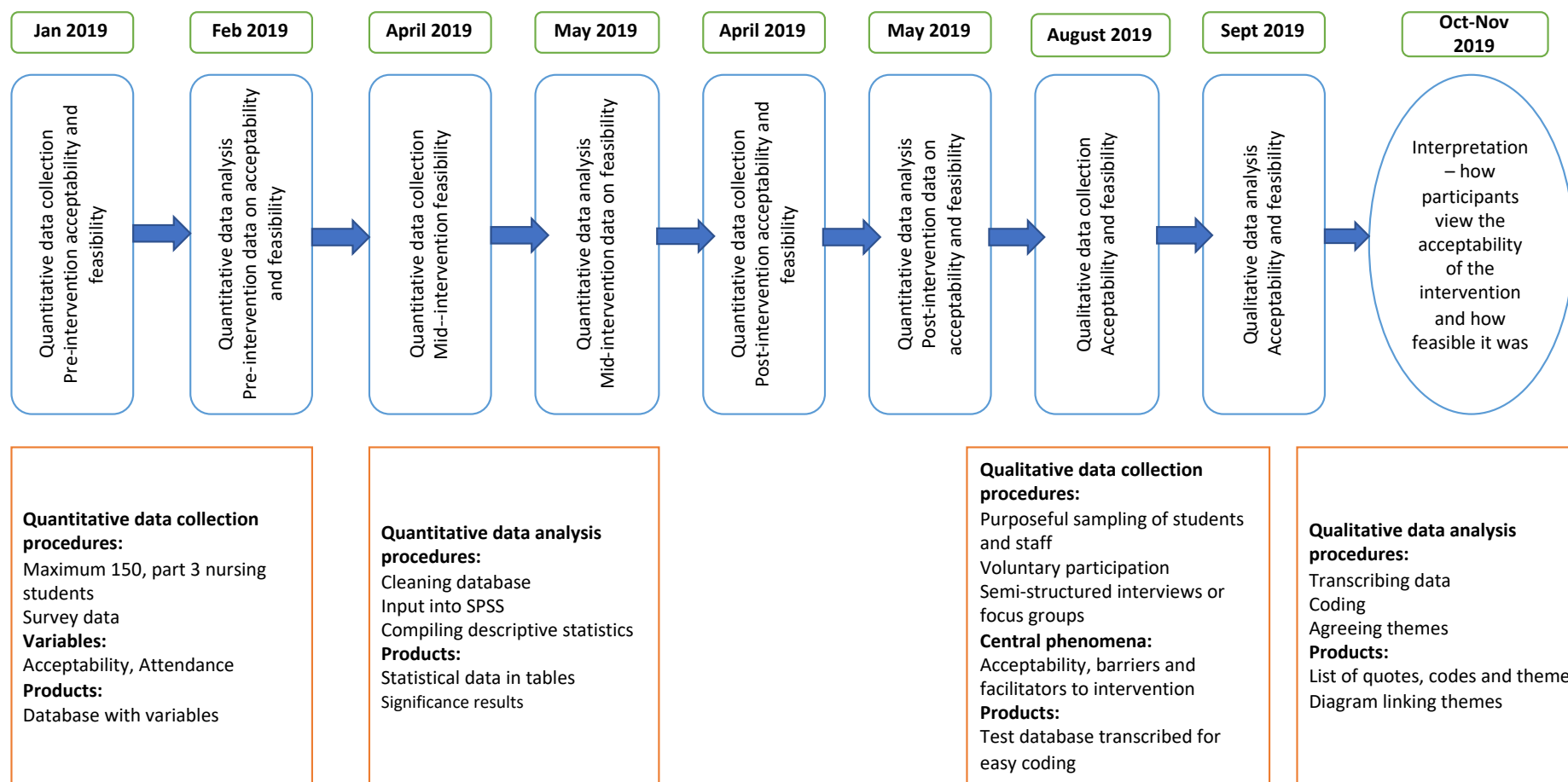


Figure 13 The explanatory sequential design of phase 2 of the study

5.2.1 Phase 2 participants

Participants for Phase 2 of the study included students and academic university staff.

Participants in the initial quantitative data collection for stage 2 of the study were exclusively students who had undertaken clinical placements at Barts Health NHS Trust and had been exposed to the intervention. The total potential population equated to 150 students and included:

3. students undertaking the Bachelor of Science (BSc) in either Children's Nursing or Adult Nursing, who commenced the nursing programme in September 2016
4. students undertaking the Post Graduate Diploma (PGdip) in either Children's Nursing or Adult Nursing, who commenced in September 2017.

Participants in the qualitative data collection stage for phase 2 of the study included students as identified above and in addition:

5. academic or administrative City, University of London staff who either contributed to the administration of the implementation of the intervention or delivered taught sessions to the students.

Both staff and students were asked to volunteer to take part in the qualitative data collection for the study to gain a range of diverse perspectives and support understanding about the acceptability and feasibility of the intervention. All participants were over the age of 18 and both men and women were invited to participate.

There were differences between the structure of the pre-registration nursing programmes for adult nurses and children's nurses, which impacted on the implementation of the intervention. Adult nursing students are aligned to a 'community of practice', which is linked to a particular healthcare organisation or group of organisations, and they undertake their clinical placement experience over the course of the pre-registration programme in that community of practice. Barts Health NHS Trust is one such community of practice and students aligned to Barts were placed in one of the five Barts Health NHS Trust sites for their clinical experience. Children's nursing students are not aligned to a particular health care organisation due to placement availability and may therefore have placement experiences in several different healthcare organisations.

Adult and child nursing students were either undertaking a pre-registration programme at bachelor's degree level (BSc), which is a three-year programme, or at postgraduate diploma level (PGdip), which is a two-year programme. Students undertaking a PGdip award had already completed a bachelor's degree prior to entry onto the programme and consequently would all have been aged 21 or older.

Inclusion criteria for both groups of participants included:

Students:

- Adult or Child BSc nursing students at City, University of London in the September 2016 cohort with placements at Barts Health NHS Trust.
- Adult or Child PGdip nursing students at City, University of London in the September 2017 cohort with placements at Barts Health NHS Trust.

Staff:

- Academic or administrative staff members of the School of Health Sciences who had been involved in facilitating the intervention delivery

Exclusion criteria for both groups of participants included:

Students:

- Students from other universities
- Students who had not undertaken clinical placements at Barts Health

Staff:

- Academic or administrative staff members who had not been involved in facilitating the intervention delivery by delivering taught sessions, facilitating group sessions, or conducting administration associated with the intervention implementation.

5.2.2 Phase 2 Recruitment

As with phase 1, the ethical considerations underpinning the recruitment processes are explored in Chapter 3, section 3.6.

5.2.2.1 *Student participants*

Potential student participants for phase 2 of the study were identified by the course officers at City, University of London School of Health Sciences, drawing on established databases of students by educational programme and clinical placement. Personal data were limited to name, email address and placement area.

Participants were approached and recruited by a female researcher. The students did not have had any previous association with these two team members so there was a lower risk of coercion or bias than if potential participants are approached by lecturers with whom they are familiar, or who were involved in assessing the students.

Recruitment occurred in four ways:

1. The researcher gave a verbal presentation to the identified potential participants in group forums about the study and gave them flyers and participant information sheets for consideration. This occurred when the students were already in the university for teaching sessions.
2. Posters were placed in communal areas advertising the study and asking for participants to contact the researcher.
3. The researcher attended the Student Staff Liaison Committees, which brought together student representatives and educational programme teams, to explain the project and distribute flyers.
4. All students who met the inclusion criteria were emailed, with a Participant Information Sheet and consent form attached, inviting them to take part in the study.

Students were rewarded with £10 a voucher that could be exchanged for online shopping if they completed the data collection, as compensation for their time. They were notified of this in the Participant Information Sheet. Ethical considerations of gift payments were considered and are outlined in Chapter 3, Page 172.

5.2.2.2 *City, University of London Staff Participants*

Potential staff participants for the qualitative aspect of stage 2 of the study were approached if they had either facilitated group sessions, taught content during the sessions or been responsible for the administrative elements of the implementation of the intervention. The study was presented at a divisional meeting in the Nursing Division to raise awareness of the intervention with potential participants. All potential participants were also emailed the Participant Information Sheet and invited to contact the study team if they were interested in participating.

5.2.3 Phase 2 sampling

The potential population was determined by the total number of students and staff who met the inclusion criteria. To add rigour to the study, it was important that the sample was adequate in its ability to provide sufficient information for comprehensive analysis (Yardley, 2000). As this was a mixed methods study, two different sampling methods were used. Quantitative data were collected by means of a questionnaire administered to a convenience sample of all those who undertook the intervention. This was completed at points when the participants were attending taught sessions at university and were therefore available. This comprehensive approach provided reliable and accurate quantitative data from the population of students who undertook the intervention (Hall, 2020). To select participants for the interviews, purposive sampling was used. Purposive sampling is often used to identify and select all cases that meet the predetermined criteria, in this case, students or staff who had engaged with the intervention, and then ensure the participants are representative of the population and likely to provide depth and understanding. In this case this resulted in selecting a sample that included both adult and children's nursing students, academic staff, and facilitators. It is particularly useful to purposively identify cases to follow up from survey data in mixed methods research. In this study, consideration was given to the need to capture the views of all groups playing a role in the implementation of the intervention. Focusing on only students who met the criteria, for example, would have failed to capture the insights of academic staff or facilitators, limiting the breadth of understanding about the feasibility of the intervention. Whilst purposive sampling is useful to identify information-rich participants, the degree of

variability between participants is often unknown at the point of sampling, therefore iterative methods may also need to be used in conjunction with purposive sampling (Palinkas, et al., 2015). Regular research team meetings to review data collection supported decisions about data saturation and potential additional sampling strategies.

Both adult and child nursing students were invited to participate in the feasibility study as this provided data on the barriers and facilitators to implementation across adult and child nursing cohorts and supported decisions regarding progression of the intervention in subsequent years and other settings. All participant students were invited to complete the questionnaire data. All participants were also invited to participate in semi-structured interviews and individuals were purposively chosen from the volunteer group to capture views from adult, child, BSc and PGdip nursing students to maximise breadth of data. All nine staff who met the inclusion criteria were invited to participate in the study, to maximise the breadth and depth of perspectives reported. Purposeful sampling supported attempts to gain as heterogeneous a sample as possible so that, should common views be expressed, the evidence would be stronger that these views were not limited to one group. This also supports the application of the findings to other contexts (Robinson, 2014).

5.2.4 Phase 2 data collection

Phase 2 data were collected to assess whether the intervention was acceptable to participants and what the barriers and facilitators were to the implementation. Collecting both quantitative and qualitative data enabled deeper exploration of the elements that participants found particularly beneficial or challenging.

5.2.5 Measures: acceptability and feasibility

Data for phase 2 of the study were collected using questionnaires, semi-structured interviews, and focus groups. Quantitative questionnaire data were collected from adult and children's nursing students at City, University of London, who were in the final year of their programme, and qualitative data from students, and academic staff.

5.2.5.1 Acceptability Questionnaire

Acceptability data were collected using the questionnaire for acceptability data collection included in the published paper included in this chapter. The questionnaire was developed for this study and the format used is included as Appendix 11. As with the questionnaire used in phase 1 of the study, the questions were informed by the seven constructs of the Theoretical Framework of Acceptability (Sekhon, et al., 2017), and used a likert-type scale to collect data with additional free-text options.

Detail of all acceptability quantitative data collection is in Table 14. Open questions were deliberately included as a strategy to identify further issues for inclusion in the interviews and focus groups and to complement responses to closed questions (O’Cathain and Thomas, 2004). The questionnaire was piloted prior to use with the participants and construct validity and social desirability bias were key areas of consideration.

The questionnaires were administered using hard copies at the end of the first and the last intervention sessions, in the presence of the facilitators. This pre-test -post-test design was used to explore changes in participant perceptions of acceptability over time. Consequently, the wording of the questions was changed slightly at each point to capture the prospective and retrospective views of participants about the acceptability of the intervention. The questionnaires were self-administered to mitigate social desirability bias, and participant numbers rather than names were used to preserve privacy and a sense of anonymity for participants.

5.2.5.2 Attendance data

Data on attendance at the intervention sessions were collected as a proxy measure for engagement. Attendance was determined by the facilitators who completed a register of attendees during the intervention sessions. Detail of feasibility data collection is given in Table 14.

Table 14 Detail of acceptability and feasibility data collection

Central concept	Data collection tool	Data collection points	Output
Acceptability of the intervention	Likert-style questionnaire devised using the Theoretical Framework of Acceptability (Sekhon, et al., 2017) Questions were adapted slightly for each data collection time point. Additional free-text options were available so that participants could expand on their responses.	At the beginning and the end of the intervention: Prospectively and retrospectively	Measures of student opinions on the acceptability of the intervention
Feasibility of implementation of the intervention	Attendance data of participants at intervention taught or group sessions	After each intervention session	Summary of student attendance suggesting engagement

5.2.5.3 Qualitative Interview Data

Qualitative data were included in the design to explain the quantitative feasibility and acceptability data more fully, for example by enabling greater understanding of the contextual issues that may have impacted on students' ability to attend intervention sessions. Qualitative semi-structured interviews were conducted with participants receiving the intervention and with staff members involved in the implementation of the intervention. Prerequisites for using semi-structured interviews in studies have been developed (Kallio, et al., 2016), which in this phase of the study have been met because participants were asked to discuss their (often complex) perceptions, emotions, and opinions. The interview guide was compiled following analysis of the quantitative questionnaire and attendance data. Areas of interest and areas that required further explanation formed the focus of the interviews. The interviews were conducted after the intervention had been completed and after quantitative data were analysed. The interview schedule for the semi-structured interviews is included as Appendix 12 and 13.

5.2.6 Data collection timing

The intervention was implemented between January and July 2019 across three separate groups of students:

- BSc pre-registration children's nursing students on four separate days in January/February;
- BSc pre-registration adult nursing students on four separate days between March/April;
- A combined group of PGdip adult and child pre-registration nursing students on three separate days in May.

The PGdip students were unable to attend for four days due to timetabling issues but participants received the same intervention content condensed over the three days. Questionnaire data collection occurred at the beginning and end of each intervention run and interviews with staff and students occurred between three- and six-months post intervention, depending on the cohort.

5.2.7 Analysis: quantitative data

Acceptability questionnaire descriptive statistics were reported as frequency of response choice for each question. Wilcoxon signed ranks were used to compare pre and post intervention samples to assess difference over time. Attendance data were reported as frequency of attendance at each session and for each student group.

5.2.8 Analysis: qualitative data

Qualitative data, collected from free-text boxes on the questionnaires or from semi-structured interviews, were thematically analysed. As in phase 1 of the study, thematic analysis, as described by Braun and Clarke (2006) was chosen because of the flexibility of the method in terms of sample size and constitution, research question and data collection method (Braun and Clarke, 2017). Thematic analysis was appropriate for analysis of both sets of data, despite the potential differences between the data sets. There was a difference in sample size between students in phase 2 and academic staff members in phase 2 but the flexibility of thematic analysis accommodated these differences. Additional benefits of using thematic analysis related to the accessibility of the method and of the results, the potential to highlight both differences and similarities across the data set, which may be useful when comparing responses from students and staff members, and the ability

to summarise key features of the data and present the thick description of the data set (Braun and Clarke, 2006).

Qualitative data analysis followed the six phases of thematic analysis, as in phase 1 of the study: 1) Familiarisation with the data; 2) Generation of initial codes; 3) Searching for themes; 4) Reviewing themes; 5) Defining and naming themes; and 6) Producing a report (Braun and Clarke, 2006). Also, as in Phase 1 of the study, steps were incorporated as indicated in Table 7 (adapted from Nowell, et al., 2017) for the analysis to meet the Lincoln and Guba's (1985) concept of trustworthiness.

Interviews with students were conducted by two female researchers, who were also facilitators of the intervention. They were familiar to the participants but did not have any previous relationship or ongoing influence. One researcher was a nurse, and one was an academic with a PhD in Psychology. Focus groups with academic staff were conducted by an experienced female academic researcher independent to the staff group, with no prior relationship, ongoing influence, or previous nursing experience. The researchers introduced themselves and the study to the participants at the start of the focus groups and interviews. All qualitative data were collected on university premises or by telephone. Data collection ceased once all selected participants had been interviewed, however recurring themes were noted by the interviewers and data saturation was deemed to have been reached as no new themes were arising.

Data saturation is the point when enough information has been collected to replicate the study (O'Reilly & Parker, 2012) and when no new or further coding is feasible or new information is obtained (Guest et al., 2006). Data collection in this study was limited by the number of participant volunteers, although a greater quantity of interviews may only have contributed to the thickness of the data, rather than the richness of the data (Hennink, et al., 2020 P109). There is no set number of interviews required to reach data saturation as each study is contextually different and, as in this study, the researcher interviews who they can (Bernard, 2012). The semi structured nature of the interviews supported data saturation to be reached as all the participants were asked similar stem questions, which reduced the variability of the answers.

Although it cannot be assumed that because the resources (volunteer participants) were exhausted, data saturation was reached, the strength of this study lies in the triangulation of data obtained from different sources and using different methods, which ensures the data is rich and deep (Heale and Forbes, 2013). Triangulation has been described as crystal refraction or looking at data as many points of light (Denzin, 2012) to perceive all the different perspectives and viewpoints inherent in the data, which ultimately contributes to the validity of the findings.

The concept of rigour was considered and incorporated into the design and implementation of the research by following several processes outlined in Table 15 (adapted from Nowell, et al., 2017).

Table 15 Processes incorporated into the thematic analysis to support rigour

Concept	Action in this PhD study
Credibility - The fit between the participants' views and the researcher's representation of them	• Data triangulation – survey data, interview data and field notes were collected • Researcher triangulation – analysis was conducted by more than one researcher in parallel • Peer debriefing was conducted whilst the research was in progress to discuss themes • Member checking of the analysis to confirm it related to their experiences
Transferability – whether the findings can be generalised to a different site	• Thick descriptions were provided so that other researchers or educationalists could judge transferability to their own site.
Dependability – whether the process is logical, traceable and clearly reported so that readers can make a judgement about the dependability of the research	• An audit trail was provided of the decisions and choices made during analysis so that all research team members and other readers could clearly follow the decision trail and potentially arrive at comparable conclusions. This included keeping: ○ Records of the raw data, field notes and transcripts, ○ A reflexive journal • The study was reported in accordance with the Consolidated criteria for reporting qualitative research (COREQ) 32 item checklist (Tong, et al., 2007) to enhance transparency about important aspects of the research team, findings, analysis and interpretations
Confirmability – establishing that the findings are derived from the data	• How conclusions and interpretations were reached was demonstrated by: ○ Explicit discussion about the analytical choices ○ Explicit discussion about theoretical underpinning

	• Reflexive notes were kept that included: ○ Logistics of the research ○ Methodological decisions and rationales ○ Reflections on researchers' personal values and interests

5.3 Phase 2: Implementation of the intervention

The intervention was finalised in August 2018, and implemented between January 2019 and May 2019 to a total of 74 final year adult and child nursing students in three separate groups. All aspects of the intervention were chosen by democratic process and approved by the co-production group. The intervention included four sessions (BSc adult and child nursing students) or three sessions (PGdip adult and child nursing students), and incorporated Acceptance and Commitment Training (ACT), subject specific interactive workshops focused on areas identified by the co-production group, and allocated time to discuss issues related to clinical practice. The co-designed intervention is illustrated in Figure 14.

ACT was introduced in Chapter 2 of this thesis as an evidence-based cognitive behavioural skills programme that helps people relate differently to difficult thoughts and emotions so that they can construct their life around what really matters to them (Harris, 2006). ACT is used as an individually focused occupational stress management intervention that is implemented to enhance employees' coping mechanisms, for example when faced with stress or dealing with challenging and unwanted emotional responses such as worry (Lloyd, et al., 2017). It is principally based on mindfulness but also focuses on identifying individual values, motivating, and empowering people to accept their painful personal events without conflict, and encouraging them to commit to positive changes. It has been successfully used in the NHS, the UK Government, and other organisations in the UK, and has also been implemented widely in America. ACT has been demonstrated to reduce psychological distress (Waters, et al., 2018) and to have a moderate effect on anxiety and depression (Heydari, et al., 2018; Hacker, et al., 2016) when used in occupational settings.

The interactive learning sessions were delivered by the study team, following a short train-the-trainer course on the delivery of ACT. The time management, developing social capital,

assertiveness, and coping with stress sessions, were requested by the co-production group, and were subsequently developed and delivered by the study team as interactive workshops. The question-and-answer sessions with early career nurses were also arranged by the study team. Nursing programme alumni now working in Barts Health NHS Trust were invited into the session to receive and answer questions relating to their experiences as early career nurses. In addition, each day there was an opportunity for the attendees to discuss issues related to their experiences in their clinical placements. This was an unstructured session with no pre-defined topic areas.

	Day 1	Day 2	Day 3	Day 4
Morning	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)	Acceptance and commitment training (ACT)
Afternoon	Time management	Developing social capital Q&A with early career nurses	Assertiveness and dealing with difficult behaviour	Coping with stress
	Discussion of issues in practice	Discussion of issues in practice	Discussion of issues in practice	Discussion of issues in practice

Figure 14 Content of the Intervention Learning Sessions

Students were invited to attend the intervention sessions at a point in their education programme when they were allocated placements with clinical partners. Non-participants remained in their clinical placement and attendees were awarded the equivalent clinical hours as non-attenders, which contributed equally towards the requirements for their NMC registration. This was implemented so that participating students were not disadvantaged in their progression towards completion of their programme and qualification as nurses. The decision was taken to offer the intervention whilst students were allocated to clinical placements rather than timetabled theory blocks at university. This was a pragmatic decision based on the level of flexibility afforded by clinical placement. Theoretical sessions at university are programmed 12 months in advance, which did not afford the same

flexibility, and the spread of students across adult and child BSc and PGdip programmes added a level of complexity that was logistically challenging.

5.4 Phase 2 results: feasibility and acceptability

Acceptability data in the form of a questionnaire were collected at two points during the intervention (beginning and end), and attendance data were collected for each interactive learning session. Semi-structured interviews were carried out with participants and academic staff who had been involved in the delivery of the intervention in August 2019. Seventy questionnaires were completed over the two time points, 12 interviews were conducted with students and seven staff attended the two focus groups. Analysis of the data was conducted between May and December 2019.

5.4.1 Participant demographics

Table 16 provides detail of the participant and wider cohort demographics. Wider cohort data were obtained by drawing on standard university data collection processes, and are presented here for comparison. Some data are absent for the participant sample, as wider data collection terms were slightly different than those used in the research study demographic questionnaire. Mean age for both the participants and wider cohort was similar. Child BSc students were underrepresented (17.1% in participant sample; 28% in wider cohort) and Child PGdip students were over represented (11.4% in participant sample; 5.7% in wider cohort). Otherwise study participants were similar to the overall cohort in the School of Health Sciences at City, University of London.

Table 16 Participant and wider cohort demographics

Participant demographics					Demographics of wider cohort				
Age	Minimum	Maximum	Mean	Std. Deviation	Age	Minimum	Maximum	Mean	Std. Deviation
All participants	20	46	26.54	6.547	Whole cohort	18	53	25.04	8.23

	Participant Demographics		Wider cohort demographics	
Degree type	Frequency (N)	Percent	Frequency (N)	Percent
Adult BSc	35	50	104	42.6
Adult PGDip	15	21.4	59	24.6
Child BSc	12	17.1	67	28.0
Child PGDip	8	11.4	14	5.7
Total	70	100	244	100
Degree	Frequency	Percent	Frequency	Percent
Adult	50	71.4	163	66.8
Child	20	28.6	81	33.2
Total	70	100	244	100
Gender	Frequency	Percent	Frequency	Percent
Female	63	90	228	93.4
Male	7	10	16	6.6
Total	70	100	244	100
Ethnicity	Frequency	Percent	Frequency	Percent
Arab	0	0	2	0.8
Asian or Asian British - Bangladeshi	9	12.9	33	13.6
Asian or Asian British – Indian	No data	No data	9	3.7
Asian or Asian British - Pakistani	1	1.4	6	2.4

Black or Black British - African	22	31.4	76	31.2
Black or Black British - Caribbean	3	4.3	6	2.4
Chinese	1	1.4	1	0.4
Information refused	0	0	6	2.4
Mixed – White and Asian	2	2.9	2	0.8
Mixed – White and Black African	No data	No data	1	0.4
Mixed - White and Black Caribbean	1	1.4	1	0.4
Other Asian background	5	7.1	21	8.7
Other ethnic background	2	2.9	5	2.0
Other mixed background	1	1.4	6	2.4
White	23	32.8	69	28.4
Total	70	100	244	100

5.4.2 Participant attendance

Although 70 questionnaires were completed over the two time points, and 74 students attended the sessions, few students attended all intervention sessions, and little is known about those who did not attend. Highest attendance was by PGdip adult and child nursing students, with an average of 77% attendance across the three sessions and 92% attending 2 or more sessions. This group of students was the most mature, having completed a first degree prior to studying to become nurses (Mean age 30.71). The lowest attendance was from BSc child nursing students, with an average across the four sessions of 35%, with 52% attending 2 or more sessions. This group of students was the youngest (Mean age 19.13), and was already undertaking the final clinical placement, completion of which was a critical element of their programme and essential for qualification. The qualitative data helped to contextualise the lower attendance, which can be attributed in part to the challenges of being released from clinical placements, or concern about the value of the intervention versus clinical experience. More detail of the attendance can be found in publication 3, included later in this chapter.

5.5 Integration of data

As in phase 1 of the study, the qualitative and quantitative results were integrated at the stage of analysis to support the explanatory aim of the study. A joint display table was created and is included below (Table 18).

Table 17 Joint Display Table of Results from Phase 2 of the Study

Quantitative Results from Acceptability scores and attendance data	Qualitative results from reflective field notes, follow-up interviews, focus groups	How Qualitative findings helped explain quantitative results
Attendance Few students attended all the intervention sessions highest attendance (72-84%) was for the mixed group of adult and child nursing post graduate diploma students.	Barriers and facilitators to implementation of the intervention were highlighted. Staff acknowledged the complexity of trying to retrofit additional sessions into established curricula. Students discussed conflicting priorities, lack of initial confidence as they found their way in new clinical placements, and the influential nature of the clinical	Implementation of the intervention in partnership with an NHS organisation and within established higher education curricula added a level of complexity that influenced student attendance and feasibility.

Lowest attendance was for BSc undergraduate degree child nursing students (26-41%).	environment on their decisions about whether to attend. Some students identified that the days provided respite from the intensity of clinical practice and the sharing of placement experience was supportive and relevant. Others felt that attendance would have been much greater when the pressures of the programme were fewer. Clinical staff were sometimes reluctant to release students to attend. This impacted on student motivation to negotiate attendance at the sessions.	
General Acceptability - Students found the intervention generally acceptable and their perception of acceptability increased pre to post intervention.	Many of the students described their clinical experience as stressful. The intervention was timely as they realised that the stress needed to be addressed and provided new skills and tools to support transition to a new role. Students described how they had incorporated the new techniques into their everyday practice and were seeing positive results.	The intervention was generally acceptable and scores for five of the seven specific acceptability constructs showed positive significant increases over time, indicating a sound platform for wider implementation. There were challenges to conveying the detail of the process prior to the experience.
Affective attitude - a significant positive increase in perception occurred pre to post intervention as students enjoyed the intervention more over time.	The experience of participating in the intervention was generally reported positively by both students and staff. Students predominantly commented on content of the intervention and staff commented on facilitation.	Opportunities to meet with peers, share placement experience and to learn new skills were appreciated as a respite from the pressure of the clinical environment.
Burden - perceived effort to participate trended towards an increase over time but not significantly.	The perception of increased burden or effort to attend over time reflects the conflicting priorities and pressures of the final stage of the nursing programme.	There was a potential relationship between the timing of the delivery of the intervention in the nursing programme and other academic and practice related priorities. Wider implementation would require careful planning to manage the complexity of accommodating the intervention in an established nursing programme, avoid work overload and placement anxiety and limit the impact on attendance.
Perceived effectiveness - a significant positive increase in perception occurred pre to post intervention as students increasingly perceived that it was effective.	Most students felt the content was appropriate and relevant to their roles as student and qualified nurses, perceiving the subject matter to be a positive addition to the traditional curricula. The focus on clinical practice and skills to support transition to early career nurse was particularly welcomed.	The intervention was perceived by student nurses to equip them with skills and experience that brought enduring personal benefit in both their professional and personal lives, with the potential to influence their transition to qualified nurses and retention.

	Students described embedding their learning into their daily activities. Staff also recognised the benefits for students and felt that the intervention would have enduring impact. They noticed subtle changes in the students' thinking and demeanor. Staff regarded the intervention as positive enhancement of the traditional university offer that would be beneficial to the students in their future career.	Students reported enduring personal benefits at the post intervention interviews, which will have influenced perceptions of acceptability and motivated attendance but also have the potential to mitigate burnout. Strategies to enhance personal wellbeing may help to support newly qualified nurses to cope in an environment with high emotional demand, understaffing or challenges with communication.
Ethicality - a significant positive increase in perception occurred pre to post intervention as students increasingly felt the intervention fitted with their personal values.	Both students and staff were unanimous in recommending that the intervention should be offered to all future students. Both staff and students would encourage colleagues and peers to become involved with delivery and attendance. Staff strongly believed that the co-designed nature of the intervention gave it credibility as a response to the expressed needs of a changing demographic of students.	If a nurse feels they are upholding their personal values in their professional work, it may offer psychological protection and increase satisfaction with the workplace. Such personal benefits may impact on nurse retention by increasing motivation, perceptions of job control and individual decision making, and attachment to the profession and the organisation.
Opportunity costs - over time the opportunity cost of participating became significantly greater.	Clinical placements were a pressurised environment, and it became difficult to attend the intervention sessions. Participants were cognisant of the power difference between students and supervisors, assessors, and ward managers in the practice areas.	For wider implementation preparatory work is essential to embed understanding about the value of the intervention and facilitate prioritisation. Consideration should be given to both student and NHS colleagues' commitments to maximise engagement and work in partnership.
Self-efficacy - a significant positive increase in perception occurred pre to post intervention as students became more confident in their ability to take part.	The students commented positively about the helpful and respectful approach of the facilitators, which made sharing difficult experiences in placement possible. This compassionate facilitation aligned with increasing confidence that students could contribute effectively. Students described many aspects of the intervention that had immediate benefit for them in both their professional and personal lives.	Despite perceptions of increased burden and opportunity cost, all those interviewed were unanimous in recognising the future potential of the intervention to support student and early career nurses.
Intervention coherence - a significant positive increase in perception occurred pre to post intervention as students	Students understood the rationale behind the intervention and recognised the relevance of the content of the sessions.	Students gained clarity, understanding and expertise, highlighting how clear and timely explanations about the

gained clarity and understanding about the intervention.		intervention may have engendered greater participation.

5.6 Publication 3: An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility

The findings were written up as a paper, which has been published in BMC Nursing, an open-access peer-reviewed international journal with an impact factor of 1.846. The journal publishes articles on aspects of nursing research, training, education, and practice. The two peer reviewers gave feedback that the paper was interesting, the study took an innovative approach, and the findings had important practical implications. The paper (as published in the journal) is included in this chapter to supplement the results section of phase 2 of the study.

5.6.1 Declaration of contribution to the development of the paper

The development of the paper was led by JB as PhD student, with feedback from supervisors to ensure that the reporting was of the highest standard. Qualitative methodology was reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong, et al., 2007). JB wrote the drafts of the paper for publication and prepared the paper for submission to the journal. LA, DS and JM were involved in the review of the drafts and gave advice about revisions.

5.6.2 Declaration form



STATEMENT OF CO-AUTHORS of JOINT PUBLICATIONS

TO WHOM IT MAY CONCERN

Title of publication: An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility

Name of candidate: Judy Brook

Title of research thesis: Development and implementation of an intervention to increase retention and decrease burnout of early career nurses

Name of first supervisor: Professor Leanne Aitken

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

Signature:

Name: Judy Brook

Date: 26.10.2020

Signature:

Name: Leanne Aitken

Date: 07.04.2021

Signature:

Name: Julie MacLaren

Date: 01.05.2021

Signature:

Name: Debra Salmon

Date: 21st April, 2021

Statement indicating the candidate's contribution to the publication

This statement is written in accordance with the Contributor Roles Taxonomy (CRediT) as this is now commonly required during the submission process and published with the paper.

Judy Brook: Conceptualisation, methodology, validation, analysis, data curation, investigation, writing – original draft, writing – review and editing, visualisation, project administration, funding acquisition.

Leanne Aitken: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Julie MacLaren: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

Debra Salmon: Conceptualisation, methodology, validation, writing – review and editing, visualisation, supervision, funding acquisition.

5.6.3 Published paper

An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility

Judy Brook, Professor Leanne M. Aitken, Dr Julie-Ann MacLaren and Professor Debra Salmon

RESEARCH ARTICLE

Open Access



An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility

Judy Brook^{*}, Leanne M. Aitken, Julie-Ann MacLaren and Debra Salmon

Abstract

Aims: To understand the experiences of nursing students and academic staff of an intervention to decrease burnout and increase retention of early career nurses, in order to identify acceptability and feasibility in a single centre.

Background: Internationally, retention of nurses is a persistent challenge but there is a dearth of knowledge about the perspectives of stakeholders regarding the acceptability and feasibility of interventions to resolve the issue. This study reports an intervention comprising of mindfulness, psychological skills training and cognitive realignment to prepare participants for early careers as nurses.

Methods: This is an explanatory sequential mixed methods study, conducted by a UK university and healthcare organisation. Participants were final year pre-registration nursing students ($n = 74$) and academics ($n = 7$) involved in the implementation of the intervention.

Pre and post measures of acceptability were taken using a questionnaire adapted from the Theoretical Framework of Acceptability. Wilcoxon Signed Ranks test was used to assess change in acceptability over time. Qualitative data from semi-structured interviews, focus groups and field notes were thematically analysed, adhering to COREQ guidelines. Data were collected February to December 2019.

Results: One hundred and five questionnaires, 12 interviews with students and 2 focus groups engaging 7 academic staff were completed. The intervention was perceived as generally acceptable with significant positive increases in acceptability scores over time. Student nurses perceived the intervention equipped them with skills and experience that offered enduring personal benefit. Challenges related to the practice environment and academic assessment pressures. Reported benefits align with known protective factors against burnout and leaving the profession.

Conclusion: Planning is needed to embed the intervention into curricula and maximise relationships with placement partners. Evaluating acceptability and feasibility offers new knowledge about the value of the intervention for increasing retention and decreasing burnout for early career nurses. Wider implementation is both feasible and recommended by participants.

Keywords: Acceptability, Early career nurse, Feasibility, Intervention, Mixed methods, Nurse retention, Nurse workforce, Burnout

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Background

The retention of nurses in the international healthcare workforce is a persistent issue, with nurse vacancies increasing in many high and middle-income countries. Nurses are integral to strong and resilient health systems but current deficits between supply, demand, and population need threaten to impact on universal health coverage goals [1]. Consideration of strategies to mitigate the nursing workforce deficit has become central to health policy nationally and globally [1, 2].

Increasing the number of student nurses as a pipeline to supply the workforce is a central approach to meeting need, and newly qualified nurses form the largest group entering the profession. However, these nurses are also particularly vulnerable [3], with 30–60% leaving their first place of employment within 1 year [4–6]. The transition from student to qualified nurse can be overwhelming, especially in a complex, fast-paced and pressured work environment [7]. This situation is compounded by rising nurse vacancies and has the potential to lead to burnout.

Burnout is a concept related to negative perception of the work environment, often linked with decisions to leave the nursing workforce [8]. It is characterised by depleted personal and/or social resources [9] and has significant consequences for healthcare organisations, the individual and the patient population [8]. Known organisational and individual predictors of burnout allow interventions to be designed that will not only impact on burnout but also attrition from the profession.

This paper reports on the feasibility of implementation of an intervention to decrease burnout and increase retention of early career nurses. The perspectives of nursing students and university academic staff were sought in order to measure acceptability and identify barriers and facilitators to implementation and assess future scope for wider implementation.

Many examples of initiatives to support newly qualified nurses to stay in post and the profession have been reported. A large systematic review [10] identified key characteristics of interventions that were effective, with inconsistent or limited benefits frequently identified. The review exposed gaps related to three areas: evidence citing the explicit involvement of student or newly qualified nurses in the design of these interventions; the perspectives of the student or newly qualified nurses about the acceptability of the interventions; and the feasibility of the interventions from the perspectives of all stakeholders.

The expression 'nurse retention' is often used interchangeably with 'turnover' or 'intention to leave', and such confusion of terms perpetuates ambiguity and lack of understanding [11]. In this paper, the term 'nurse retention' describes a focus on decreasing attrition and

minimising nurse turnover, to keep nurses in an organisation's employment.

The concept of nurse retention consists of four attributes: motivation, intention, and individual decision; strategy and intervention; geographic context; and attachment to work [12]. To capture individual decision making, development of any interventions to support retention should incorporate the perspectives of those participating. Exploring acceptability supports understanding of the interactions, relationships and sociocultural contexts that influence perspectives of the intervention [13], and how this impacts feasibility and outcomes. It is likely to be interaction between characteristics of the individuals involved, the structure and workplace culture of the delivery environment, and characteristics of the intervention that act as facilitators or barriers to implementation [14]. Exploring these uncertainties in a feasibility study allows a larger study greater chance of success [15] and informs any required redesign [16].

The study aimed to understand the experiences of nursing students and academic staff who were involved in the implementation of an educational intervention, aimed at identifying and measuring acceptability, with a view to identifying barriers and facilitators to implementation and assessing future scope for the intervention.

Methods

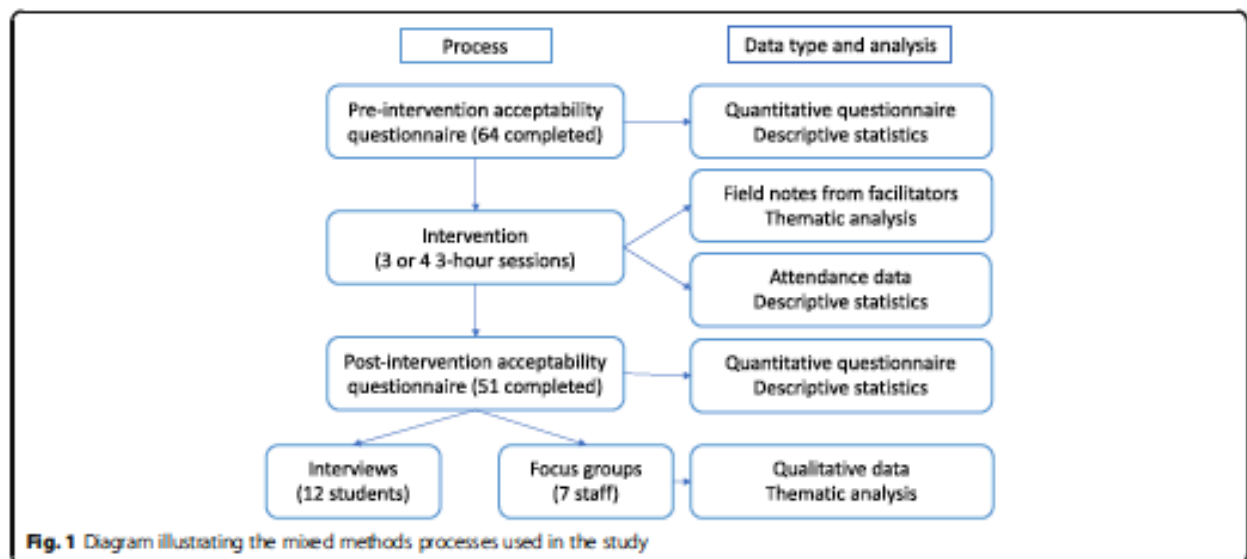
Design

This explanatory, sequential mixed methods research study combined insight from questionnaire data with participant accounts, providing a comprehensive evaluation of the feasibility and acceptability of the intervention. The sequence of processes is illustrated in Fig. 1.

This study was conducted as a partnership between a UK university and a large inner-city UK NHS healthcare organisation. The intervention was implemented at a university site familiar to the students. Intervention delivery and participant data collection occurred whilst the students were attending full-time clinical placements at the partnership NHS organisation sites, all situated within 10 miles of the University. The NHS organisation is located in a culturally and demographically diverse area, with the most unstable nursing workforce in England [17]. Relatively high cost of living, high population density, and proximity of many healthcare organisations in the city contribute to high turnover of nurses.

Sample selection

Student participants in the study consisted of adult or child nursing students who were in the final year of their pre-registration nursing programme and who had engaged with the intervention. Academic participants included any members of the academic workforce who had been involved in the implementation of the intervention,



including facilitators and nursing programme directors. All participants were purposively selected and invited by email and face-to-face to engage with the study.

Intervention

The intervention was co-designed by nursing students, early career nurses and researchers, drawing on evidence from the nursing literature, individual and collective experience. This innovative approach resulted in an intervention consisting of 3 or 4 days, called 'Activity Days', added to the nursing curriculum, in the final trimester of the pre-registration nursing programme between January and May 2019 for students working towards adult or children's nursing

qualifications. The content of the intervention is outlined in Fig. 2. Acceptance and Commitment Therapy is an evidence-based cognitive behavioural skills programme that helps people relate differently to difficult thoughts and emotions so they can construct their life around what really matters to them [18]. Social capital refers to the professional relationships, shared sense of identity, understanding, values and reciprocity that students and early career nurses develop with their colleagues to enable them to thrive in the workplace and is likely to have an impact on retention [19]. Sessions related to time management, assertiveness, coping with stress and opportunities to discuss any current issues with placements were also incorporated.

	Day 1	Day 2	Day 3	Day 4
Morning	Acceptance and Commitment Therapy (ACT)	Acceptance and Commitment Therapy (ACT)	Acceptance and Commitment Therapy (ACT)	Acceptance and Commitment Therapy (ACT)
Afternoon	Time management	Developing social capital and Q & A with early career nurses	Assertiveness and dealing with difficult behaviour	Coping with stress
	Discussion of issues in practice	Discussion of issues in practice	Discussion of issues in practice	Discussion of issues in practice

Fig. 2 Content of the Intervention Activity Days

Data collection

Quantitative questionnaire data on acceptability of the intervention and attendance data were collected, followed by qualitative data collection using semi-structured interviews, focus groups and reflective field notes. Data were collected between January and August 2019.

Attendance data

Student attendance at each of the intervention sessions was monitored and collated.

Questionnaire data

Questionnaires based on the seven constructs of the Theoretical Framework of Acceptability of Healthcare Interventions [13] were developed (Fig. 3) and used a likert-type scale to collect data with additional free-text options. Open questions were included as a strategy to identify further issues for inclusion in the interviews and focus groups and to complement responses to closed questions [20]. The questionnaire detail is provided in Table 1.

A pretest-posttest quasi-experimental design was used to explore changes in participant perceptions of acceptability; questionnaires were completed prospectively (prior to experiencing the intervention) and retrospectively (after experiencing the intervention) to explore changes in perception of acceptability over time. Question phrasing was changed for each data collection point to reflect the temporal nature of the process.

Semi-structured interviews with students

Students who volunteered were interviewed, either face-to-face or by telephone and audio recorded. Each participant was only interviewed once. The topic areas were derived from the questionnaire data and included what went well,

what could be changed, challenges, perceptions of relevance and benefit, and future scope of the intervention. Interviews were conducted using a conversational style that involved questions and prompts where appropriate. Interviews lasted on average 40 min and only involved the interviewer and interviewee.

Staff focus groups

Academic staff were invited to take part in a focus group to discuss their experience. Topic areas were determined by issues raised in the questionnaire data and included logistical challenges, relevance and appropriateness of the intervention content, ideas for improvement and future scope, and any unintended consequences of the intervention on curricula or clinical placements. Focus groups involved only the participants and the facilitator, lasted 1 h and were audio recorded.

Reflective field notes

Intervention facilitators were invited to provide reflective notes about their experience of the sessions, particularly how they felt as facilitators, what went well, what was challenging and how the process could have been improved. Four of the 6 facilitators provided field notes.

Ethical considerations

Ethical approval and permission to conduct the research was gained from the university and health service. Specific consideration was given to the voluntary nature of participation, including lack of coercion, the need for informed consent and respecting the anonymity of the participants. Participation was voluntary and informed consent was gained from all participants at the beginning of the study and repeated prior to participation in interviews or focus groups.

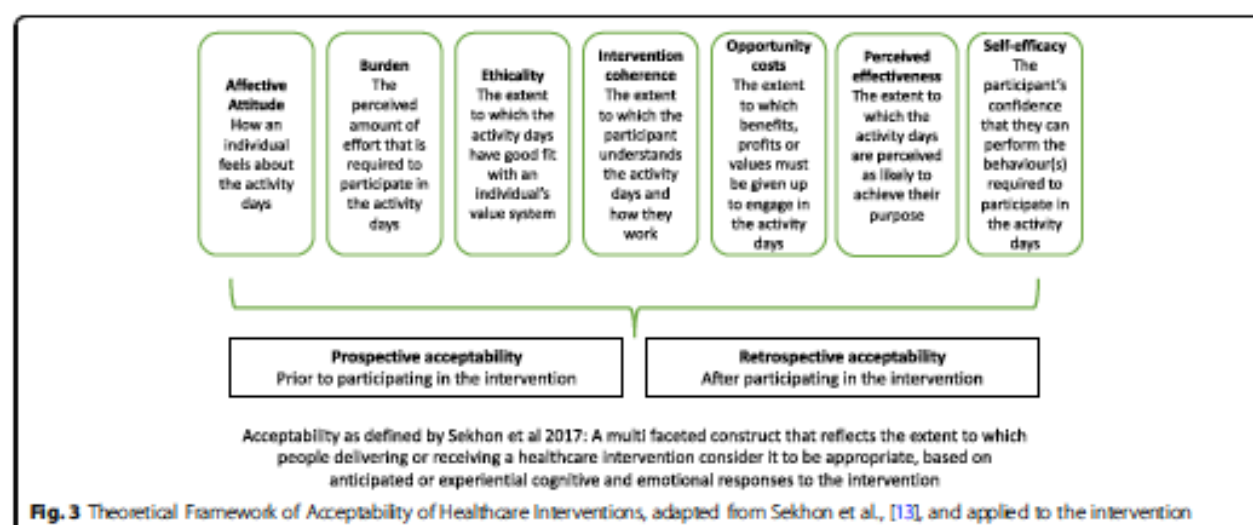


Table 1 Detail of Acceptability Questionnaire Questions and scoring

Questionnaire: students were asked to circle the answer on a 5-point likert-type scale that best suited their opinion. Each question was phrased to reflect the temporal nature of the pre-and post-questionnaires.

Question	Potential responses
1a. How acceptable do you feel it is to participate in these extra group and taught sessions? 1b. How acceptable do you feel it was to participate in these extra group and taught sessions?	Completely unacceptable (1); Unacceptable (2); No opinion (3); Acceptable (4); Completely Acceptable (5)
2a. I will enjoy taking part in the extra taught and group sessions. 2b. I enjoyed taking part in the extra taught and group sessions	Strongly disagree (1); Disagree (2); No opinion (3); Agree (4); Strongly agree (5)
3a. How much effort will it take for you to participate in the extra taught and group sessions? 3b. How much effort did it take for you to participate in the extra taught and group sessions?	Huge effort (1); Moderate effort (2); No opinion (3); Hardly any effort (4); No effort at all (5)
4. The extra sessions will be effective in helping me during my early career as a qualified nurse. 5a. I will value these extra sessions as a way of helping me get ready for my early career as a qualified nurse. 5b. I valued these extra sessions as a way of helping me get ready for my early career as a qualified nurse.	Strongly disagree (1); Disagree (2); No opinion (3); Agree (4); Strongly agree (5)
6a. Participating in these extra sessions will interfere with my other priorities. 6b. Participating in these extra sessions interfered with my other priorities.	Strongly disagree (1); Disagree (2); No opinion (3); Agree (4); Strongly agree (5)
7a. How confident do you feel about participating in the extra taught and group sessions? 7b. How confident did you feel about participating in the extra taught and group sessions?	Very underconfident (1); Underconfident (2); No opinion (3); Confident (4); Very confident (5)
8. It is clear to me how participating in the extra taught and group sessions will help me to cope better with the transition from student to qualified nurse.	Strongly disagree (1); Disagree (2); No opinion (3); Agree (4); Strongly agree (5)

Data analysis

Questionnaire data were analysed initially by all members of the research team to inform the discussion points for the interviews and focus groups.

Quantitative data

Acceptability questionnaire descriptive statistics were reported as frequency of response choice for each question. Wilcoxon signed ranks were used to compare pre and post intervention paired mean ranks to assess difference over time. Attendance data were reported as frequency for each session and each student group.

Qualitative data

Thematic analysis of acceptability questionnaire free text comments, focus groups, interviews, and field notes followed Braun and Clarke's [21] six phases. Data from staff and student participants were analysed separately. Data analysis was supported by use of Nvivo software V12.

Validity and reliability/rigour

The multi-component Theoretical Framework of Acceptability supports an acceptability issue to be identified at source and allows refinement of an intervention prior to wider implementation [13]. To enhance content and construct validity, the questionnaire was piloted with a small group of non-participants and reviewed by the framework

author, after which small changes to wording were made to improve clarity. Questionnaires were self-administered in the presence of the intervention facilitators. Use of participant numbers mitigated social desirability bias by reassuring participants of the confidentiality of their answers.

Interview and focus group guides were formulated following analysis of questionnaire data and decisions about which aspects required further explanation. Interviews with students were conducted by two female researchers; a nurse with experience and training in qualitative research, and an experienced academic with a PhD in Psychology. The researchers facilitated the intervention but did not have any previous relationship or ongoing influence. Focus groups with academic staff were conducted by an experienced female academic post-doctorate researcher independent to the staff group, with no prior relationship, ongoing influence or previous nursing experience. The researchers introduced themselves and the study to the participants at the start of the focus groups and interviews. For the duration of the study the research team met regularly for reflexive discussions to explore their biases, assumptions and relationship to the research topic. All qualitative data were collected on University premises or by telephone. Data collection ceased once all volunteers had been interviewed, recurring themes were noted by the interviewers and data saturation was deemed to have been reached.

To preserve the anonymity of the participants, and mitigate bias, each participant was assigned a number and this was thereafter used to identify quotes from interviews or field notes.

Results

Seventy-four students engaged with the intervention and 70 completed the acceptability questionnaire at one or more time points. The mean age of student participants who attended 1 or more intervention sessions and completed 1 or more acceptability questionnaires was 26 years (SD 6.54). Fifty (71%) were undertaking adult nursing programmes and 20 (29%) undertaking child nursing programmes, with 47 (67%) studying for a bachelor's degree (BSc) and 23 (33%) studying for a post graduate diploma (PGdip). Twelve students were interviewed, and 7 academic staff attended one of two focus groups. Academic staff were either Lecturers or Senior Lecturers teaching on the nursing programmes. As participants were volunteers, reasons for non-participation in the interviews or focus groups are unknown.

Attendance

Few students attended all of the intervention sessions, however, highest attendance (72–84%) was for the mixed group of adult and child nursing post graduate diploma students. As this was the second degree for these students, they were older, more experienced at studying and potentially more experienced at managing multiple priorities. Lowest attendance was for BSc undergraduate degree child nursing students (26–41%). These students were the youngest group, the first cohort to receive the intervention and were working full-time in their final placement, which was critical to complete their academic programme to qualify as nurses. Further detail is given in Table 2.

Acceptability questionnaire results

One hundred and five questionnaires were completed (64 pre and 51 post). Students found the intervention generally acceptable and their perception of acceptability increased pre to post intervention (Table 3). For five of the seven acceptability constructs, a significant positive increase in perception occurred. Students enjoyed the

intervention more over time, increasingly perceived that it was effective, felt the intervention fitted with their personal values, gained clarity and understanding about the intervention, and became more confident in their ability to take part. Conversely, responses to questions related to the extent to which taking part interfered with other priorities, indicated that over time the opportunity cost of participating became significantly greater. Perceived effort to participate, relating to the construct of burden, trended towards an increase over time but not significantly. For most items on the acceptability questionnaire there was no association between perceptions of acceptability prior to participation and frequency of attendance, although participants who attended 2–4 sessions (compared to 1 session) were more likely to agree that they were clear how participating would help them to cope better with the transition from student to qualified nurse ($\chi^2 13.53$, $p = 0.004$) (Table 3).

Qualitative findings

Thematic analysis conducted on interview and focus group data, reflective field notes and free text comments from the acceptability questionnaires, identified three themes in both student and academic staff data: experience; identifying facilitators and overcoming barriers; and future scope. Six subthemes included: content and relevance; delivery and logistics; attendance, engagement and timing; role of the practice environment; enduring impact; beneficial effect (Fig. 4).

Experience

The experience of participating in the intervention was generally reported positively by both students and staff, reiterating findings from the student acceptability questionnaire that affective attitude was more positive over time. Students predominantly commented on content of the intervention and staff commented on facilitation.

Content and relevance

Most students felt the content was appropriate and relevant to their roles as student and qualified nurses, perceiving the subject matter to be a positive addition to the traditional curricula. The focus on clinical

Table 2 Attendance by session and degree

Degree	No. invited to attend (baseline)	Number (%) attended by session ^a				
		Session 1	Session 2	Session 3	Session 4	Attended 2 or more sessions
BSc Adult	47	26 (55%)	28 (60%)	28 (60%)	24 (51%)	37 (79%)
BSc Child	27	7 (26%)	11 (41%)	11 (41%)	8 (30%)	14 (52%)
PGDip Adult & Child	25	21 (84%)	19 (76%)	18 (72%)	N/A	23 (92%)

^aFor PGdip students, the same content was compressed into three sessions due to timetabling restraints

Table 3 Intervention acceptability pre- and post Intervention

Question number/construct	Median (Interquartile range)		Wilcoxon Signed Ranks test	
	Pre-intervention	Post-intervention	Z	p
1. Overall acceptability	4 (4–5)	5 (4–5)	−2.78	0.006**
2. Affective attitude	4 (3–4)	5 (4–5)	−4.06	< 0.001***
3. Burden	2 (2–4)	2 (2–4)	−1.82	0.066
4. Perceived effectiveness	4 (3–4)	5 (4–5)	−3.60	< 0.001***
5. Ethicality	4 (3–4)	5 (4–5)	−2.58	0.009**
6. Opportunity costs	3 (2–4)	4 (2–4)	−2.91	0.003**
7. Self-efficacy	4 (3–4)	4 (4–5)	−2.1	0.040*
8. Intervention coherence	4 (3–4)	5 (4–5)	−3.92	< 0.001***

Key: * < 0.05, ** < 0.01, *** < 0.001

practice and skills to support transition to early career nurse was particularly welcomed.

It was everything that I felt like University hadn't identified as important, which was actually so important in practice, you incorporated it into a three-week course. (student 9 interview)

These sentiments were echoed by the staff, who identified that the co-produced nature of the intervention lent additional credibility to the content. As highlighted in the questionnaire data related to intervention coherence, students understood the rationale behind the intervention and recognised the relevance of the content of the sessions.

Delivery and logistics

The nature of the intervention, incorporating psychological skills training, and small and large group work, encouraged facilitators to limit the sense of hierarchy in the groups, by appropriately sharing personal and work experiences. The students commented positively about the helpful and respectful approach of the facilitators,

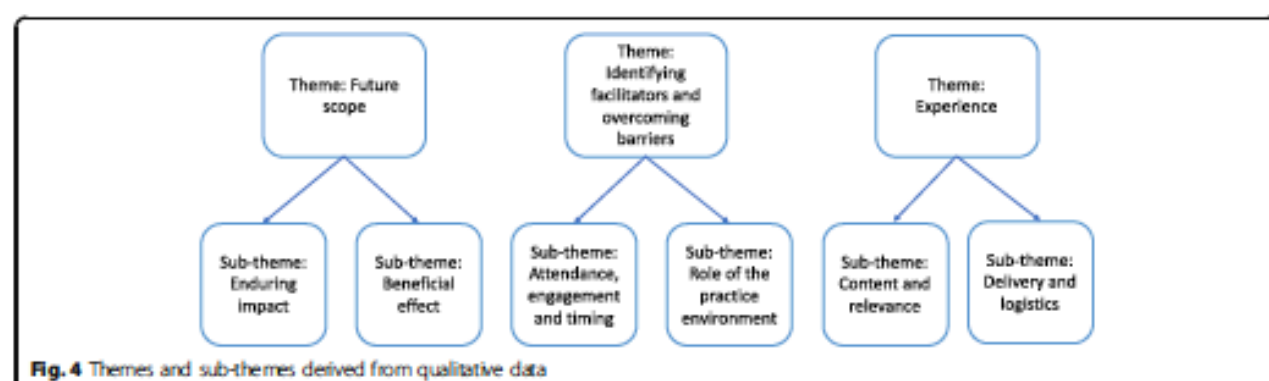
which made sharing difficult experiences in placement possible.

It just gives you time to relate to everyone else, because everyone spoke about their experiences and no one was judging anyone, everyone was just saying you know what, this is what happened in my placement...no one's there to put you down. (student 1 interview)

The compassionate facilitation of the sessions aligns with the self-efficacy scores in the acceptability questionnaire, with students becoming increasingly confident over time that they could contribute effectively.

Identifying facilitators and overcoming barriers

Across the data, barriers and facilitators to implementation of the intervention were highlighted. Staff discussed their learning from working in partnership with a large healthcare organisation and acknowledged the complexity of trying to retrofit additional sessions into established curricula. Students discussed conflicting priorities, lack of initial confidence as they found their way in new



clinical placements, and the influential nature of the clinical environment on their decision making.

Attendance, engagement and timing

Engagement with the intervention was varied. In the last trimester of the programme students had many priorities, including academic and clinical practice assessment deadlines, and full-time placement responsibilities. Staff recognised the pressures the students were under and how this affected their decision to attend.

As the pressure builds on a student through the third year ... I think so does their ability to take on new things reduce because they've got so much going on like dissertations, final placements, clinical assessments and other coursework, things like that (staff FG 2)

Some students identified that the days provided respite from the intensity of clinical practice and the sharing of placement experience was supportive and relevant. Others felt that attendance would have been much greater when the pressures of the programme were fewer.

The problem is when we're on placement we're doing full time hours plus extra study sessions and then a lot of people have to work on top of that and then that doesn't even include the people that have children and family ... I find managing my life and prioritising things so challenging. (student 9 interview)

The perception of increased burden or effort to attend over time indicated by the acceptability questionnaires reflects the conflicting priorities and pressures of the final stage of the nursing programme.

Role of the practice environment

Both students and staff commented about how clinical colleagues influenced their experience. Staff found that communication across the two organisations was challenging, with misunderstanding about the nature and value of the intervention. They recognised that the busy nature of the clinical areas was influential, as patient care was central to decision making but noted that clinical staff were sometimes reluctant to release students to attend. This impacted on student motivation to negotiate attendance at the sessions.

It's difficult because it's supposed to be a collaboration between the [NHS organisation] and the University and the students seem to have been caught a little in the crossfire, but in most cases I think the students

were able to get to attend when they needed to. (staff FG 2)

The placement, they don't like it, yeah, because it was final year placement ... They keep telling us, "Well that's irrelevant ... you shouldn't be attending those. It's more important that you attend your clinical hours." (student 6 interview)

Many of the students described their clinical experience as stressful. The intervention was therefore timely as it stimulated a realisation that the stress needed to be addressed and provided new skills and tools to support transition to a new role. Students described how they had incorporated the new techniques into their everyday practice and were seeing positive results.

The mindfulness I did find quite useful with the breathing, because the neuro placement was really hectic ... I would just focus on myself and take five seconds, ten seconds to breathe and then I'll be like OK, I've got to do this, this and this, and it helped me organise my head in a way. (Student 5 interview)

The narrative from both students and staff describing clinical practice as a pressurised environment relates to the acceptability questionnaire data showing an increase in perceived burden and significant increase in opportunity cost for students participating in the intervention.

Future scope

Both students and staff were unanimous in recommending that the intervention should be offered to all future students. Participants suggested that it should be introduced at the beginning of the nursing programme and continue as a fundamental aspect of learning until qualification. Both staff and students would encourage colleagues and peers to become involved with delivery and attendance. Staff strongly believed that the co-designed nature of the intervention gave it credibility as a response to the expressed needs of a changing demographic of students.

Beneficial effect

Students described many aspects of the intervention that had immediate benefit for them in both their professional and personal lives. They felt the sessions gave them insight into transition to a qualified nurse but also helped with their placement experiences as a student. Of particular benefit were the mindfulness and psychological skills and techniques, which students felt helped them to cope better with their emotions in difficult

situations. Likewise, the opportunity to meet with peers in a safe environment to discuss placement experiences and strengthen networks was highly valued.

It was nice that no one thought we were negative people when we discussed negative things. Most people say we should just be positive but you taught us how to and that it's okay to struggle slightly. (Child BSc Student Acceptability Questionnaire 11)

For some students the intervention was a lifeline at a difficult period of their lives.

I genuinely appreciated those sessions, as a student, and in terms of personal life as well. At one point it got quite emotional for me, because I thought, my goodness, this is really helpful. And, finally there's a focus on us students, and our mental wellbeing. (student 7 interview)

Both students and staff highlighted personal benefits of the intervention and crucially, students recognised the need to be aware of their own wellbeing, notice how they were responding to stress and take proactive action.

You get the stress where you just brush it aside but it affects us, but the sessions made me realise it affects us a lot more than we think and that if we didn't deal with it, it has such bad effects and I think that was the, the sessions helped me come to a realisation. (student 1 interview)

Enduring impact

Students described activity connected to time management, stress management and coping mechanisms related to both in their work and home lives. Although not all students were consistently using specific skills there was a sense that the sessions had changed their perspective and they could draw on the techniques and newly developed networks at difficult times.

I felt that the sessions helped me to cope with the stress and I have taken away skills that I can apply not just within nursing but in everyday life. (Adult BSc Student Acceptability Questionnaire 13)

Students described embedding their learning into their daily activities, for example by downloading mindfulness apps onto their phones and practising meditation or breathing exercises during their commute or at break times on the wards. Some described how they now accepted negative thoughts and were more conscious of how their behaviour could reflect their personal values

and impact on colleagues, friends and family; key tenets of ACT.

Meditating I tried, but it's just so difficult when you're stressed ... it's good because it made me aware of, OK my heart's racing, OK I, you know, I can't seem to breathe properly. It was great to be aware and notice your feelings, but I wasn't able to put myself in the full meditation mode. (student 6 interview)

Staff also recognised the benefits for students and felt that the intervention would have enduring impact. They noticed subtle changes in the students' thinking and demeanour. The staff members anticipated that the new skills would support students to deal with the challenges, such as low self-esteem, helplessness and home-life responsibilities.

What they were doing as part of this study actually began to bleed through into some of their thinking about other things, which is difficult to capture objectively but ... I think it was a really positive experience (staff FG 1)

Staff regarded the intervention as positive enhancement of the traditional university offer that would be beneficial to the students in their future career. This positive perception of the immediate and enduring impact of the intervention by both students and staff aligns with the acceptability questionnaire data indicating a significant increase in perception of the intervention as an effective mechanism for supporting early career nurses.

Discussion

The deficit of nurses in the healthcare workforce has motivated a plethora of initiatives to encourage retention of newly qualified nurses but to date there is little published research about the acceptability of these interventions [10]. To understand more about the impact of the intervention, this study was designed to explore the experiences and perceptions of nursing students and academic staff during implementation of a novel intervention. The findings raised key points for discussion: first, the intervention was generally acceptable and scores for five of the seven specific acceptability constructs showed positive significant increases over time, indicating a sound platform for wider implementation. Second, the intervention was perceived by student nurses to equip them with skills and experience that brought enduring personal benefit in both their professional and personal lives, with the potential to influence their transition to qualified nurses, burnout and retention. Third, implementation of the intervention in partnership with an NHS organisation and within

established higher education curricula added a level of complexity that influenced student attendance and feasibility.

Acceptability is increasingly being recognised as a key aspect of developing healthcare interventions [22]. Strengths of the Theoretical Framework of Acceptability [13] include the definition, the multi-faceted construct, and prospective and retrospective assessment of acceptability. Individuals may perceive an intervention differently before they experience it than after.

Students did indeed significantly change their perception of intervention acceptability over time, reinforcing the value of temporal assessment to support decisions about feasibility. For five of the seven constructs this was a positive change as they gained clarity, understanding and expertise, highlighting how clear and timely explanations about the intervention may have engendered greater participation.

Findings for two acceptability constructs indicated a less positive trend in perception of the intervention. Over time the perceived cost of participating became greater, as did the perceived effort to participate. Data from the interviews and focus groups indicated a potential relationship between the timing of the delivery of the intervention in the nursing programme and other academic and practice related priorities. This was evident in the language students used in their interviews, frequently referring to stress and pressure, compounded by accounts of busy and under-staffed placement environments. Stress related to nursing programmes is a recognised phenomenon [23], is associated with academic, clinical or personal/social stressors [24] and there is a strong relationship between stress and attrition [25, 26]. In particular, students experience moderate to severe levels of stress during clinical practice [27], highlighting the importance of addressing both individual stress and organisational stressors [28] to mitigate the impact on students. Wider implementation would require careful planning to manage the complexity of accommodating the intervention in an established nursing programme, avoid work overload and placement anxiety and limit the impact on attendance.

Perceptions of burden and opportunity cost were also influenced by the relationship with the NHS organisation. The findings indicate that the participants were cognisant of the power difference between students and supervisors, assessors, and ward managers in the practice areas. Relationships with clinical staff are frequently cited as a stressor for nursing students [23], with effective supervision and a supportive environment critical to students feeling a sense of empowerment [29]. Where learning is not optimised, competence and confidence can be affected [30, 31] and this may explain the difficulty students reported when deciding to engage with the intervention. For wider

implementation preparatory work is essential to embed understanding about the value of the intervention and facilitate prioritisation. Consideration should be given to both student and NHS colleagues' commitments to maximise engagement and work in partnership. Future work around feasibility should include the views of a wider range of stakeholders from the NHS organisation. Despite perceptions of increased burden and opportunity cost, all those interviewed were unanimous in recognising the future potential of the intervention to support student and early career nurses.

A key facilitator to wider implementation was the innovative nature of the content of the intervention, which drew on theories of stress and wellbeing. The effective combination of exposure to new knowledge, together with a cognitive reappraisal and relaxation techniques [28], was enhanced by additional exposure to new knowledge about early career nursing practice. Students reported enduring personal benefits at the post intervention interviews, which will have influenced perceptions of acceptability and motivated attendance but also have the potential to mitigate burnout. Strategies to enhance personal wellbeing may help to support newly qualified nurses to cope in an environment with high emotional demand, understaffing or challenges with communication [32]. If a nurse feels they are upholding their personal values in their professional work, it may offer psychological protection and increase satisfaction with the workplace [33]. Similarly, such personal benefits may impact on nurse retention by increasing motivation, perceptions of job control and individual decision making, and attachment to the profession and the organisation [12].

Strengths and limitations

The strength of this study lies in the novel approach to development and application of the intervention, spanning boundaries between nursing practice and higher education. To our knowledge, the intervention is of unique design and the findings are relevant to a range of both academic and healthcare settings. The mixed methods design, the range of participant voices and the breadth of data sources further strengthens the credibility of the acceptability and feasibility, with qualitative data adding depth and contextualisation to questionnaire data.

A potential limitation is the attendance at the intervention. Although 70 acceptability questionnaires were completed, few students attended all intervention sessions and little is known about the views of those who did not attend. However, the qualitative data helped to contextualise the lower attendance. The single study site is a further limitation. Additional studies of feasibility are recommended across an increased number of sites with different characteristics.

Conclusion

Nurse retention is a global concern and focusing on preparing student nurses for their early career in order to decrease burnout and increase retention is an essential element of strategies to address the issue. This study was designed in recognition of the importance of intervention acceptability to successful implementation and offers a novel approach that explores both prospective and retrospective participant perceptions. The findings indicate that not only was the intervention perceived as acceptable but the positive perception increased over time. Although challenges of the practice environment and pressures of academic assessment impacted on attendance, the personal benefits reported by participants align with known protective factors against burnout and decisions to leave the profession. Wider implementation would require careful planning to incorporate the intervention into curricula and maximise the potential of the relationship with practice partners. Evaluating acceptability and feasibility of the intervention offers new knowledge about the value of the content and allows us to conclude that wider implementation is both recommended by participants and feasible.

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Declarations

None.

Authors' contributions

All four authors (JB, LA, DS and JM) have made substantial contributions to conception and design, and interpretation of data. JB was involved in collection and analysis of the data. All four authors were involved in drafting the manuscript or revising it critically for important intellectual content. All four authors have read and given final approval of the version to be published.

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Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to the need to maintain the anonymity of participants but are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Ethical approval was gained from City, University of London School of Health Sciences Research Ethics Committee (reference: Staff/17-18/18), the Health Research Authority (21.06.18 IRAS ID: 245992) and by the Barts Health NHS Trust Research and Development Department (02.07.18: R&D No: 012400) with respect to research capacity. Participation was voluntary and informed consent was gained in writing from all participants at the beginning of the study and repeated verbally prior to participation in interviews or focus groups. Completion of questionnaires by participants was taken to indicate consent.

Consent for publication

Not applicable, all data is anonymised.

Competing interests

The authors declare that they have no competing interests.

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5.7 Phase 2: summary and conclusion

The retention of nurses in the international healthcare workforce is a persistent issue, particularly early career nurses, who are more vulnerable to choosing to leave their job or the profession than those later in their careers. Although interventions to increase retention have been implemented, there is little understanding of the acceptability of these interventions from the perspective of those taking part. Increasingly, acceptability is recognised as being of key importance to developing healthcare interventions.

The findings demonstrated that the intervention was acceptable, and perceptions of acceptability increased significantly over time, indicating a sound platform for wider implementation. Challenges in the practice environment and pressures of academic assessment mean thorough planning and partnership working is essential to future implementation; consideration should be given to the identified challenges of retrofitting into an established nursing curriculum and developing effective communication with clinical partners.

Of note was the enduring personal benefit for both the students and the staff regarding newly developed psychological skills and behaviours. These personal benefits reported by participants align with known protective factors against burnout and decisions to leave the profession, which again point to the potential for augmented benefit if implemented more broadly. Evaluating acceptability and feasibility of the intervention offered new knowledge about the value of the content and allowed us to conclude that such wider implementation is feasible.

This chapter has presented the findings of phase 2 of the study. The final chapter will present a discussion of the key issues raised in both phase 1 and 2.

Chapter 6 Discussion and conclusion

6.1 Introduction

The retention of nurses, and in particular the retention of those in their first year of practice after qualification, has been an issue of global concern for many years. Across high- and middle-income countries, the forecast deficit of nurses in the workforce over the forthcoming decade has focused attention on the need to develop interventions that support nurses to stay in their role and in the profession.

Although there has been a shortfall of nurses spanning two decades in the UK (Finlayson, et al., 2002; Buchan, et al., 2019), the NHS acknowledged the critical level of nursing shortages in 2017, noting the pressures on the nursing workforce in their draft workforce strategy (Health Education England, 2017). This was reiterated in the NHS Long Term Plan (NHS England and NHS Improvement (NHSE&I) 2019), by which time the actual and predicted deficit had grown. In September 2019, the NHS had a nurse vacancy rate of 12%, an increase of 1% since 2017 (National Audit Office, 2020). Increased funding has been dedicated to training additional student nurses, but there is a time lag between recruiting these students and their impact on the workforce. In addition, low levels of recruitment onto nursing education programmes prior to the COVID-19 pandemic mean it is unlikely that supply will meet demand. Consequently, interventions to retain those already in the workforce are of paramount importance, and this urgency to find solutions to the issue has been reflected in national policy and strategy.

In England, NHSE&I developed a retention support programme. This programme supports NHS Trusts to identify and address causes for attrition from the workforce, such as insufficient support for new starters. Since 2017, the programme has successfully facilitated reductions in leavers from those Trusts that have been supported (National Audit Office, 2020) and the NHSE&I People Plan delivery programme promises to enhance this impact (NHS England, 2020). Although the global Coronavirus pandemic has renewed interest in nursing careers, with increased cohort sizes for nursing programmes across the UK in September 2020 (Department of Health and Social Care, 2020), the demands on the NHS

have also been immense, reiterating the need for a sustainable and sufficient workforce for the future.

Internationally, the nursing shortage has resulted in many publications reporting the implementation of interventions to increase retention of nurses, but an initial scoping review indicated that there were significant gaps in the body of knowledge about key aspects of these interventions. These gaps related to 1) the components of those interventions that contributed to their success; and 2) the explicit participatory nature of work to design these interventions to increase retention of early career nurses. It was these gaps that this PhD study sought to address by co-producing and implementing an intervention with input from early career nurses themselves.

Nursing vacancies are particularly high in London (15%), where this study was conducted. It was the overt challenges that faced the local workforce, such as an average annual turnover of 16% at the start of the study in 2017, that prompted the conceptualisation of the wider Burdett Trust for Nursing funded study, of which this PhD study is a part, and the partnership with Barts Health NHS Trust. The research partnership was built on the foundation of an established educational partnership, with Barts Health NHS Trust hosting around 400 nursing students each year to undertake the clinical placement elements of their education programmes. Many City, University of London alumni are also employed by Barts Health NHS Trust on qualification, meaning the potential benefits from developing and implementing a successful intervention to increase retention of early career nurses were likely to be mutual.

This study was conceived in response to the Burdett Trust for Nursing 2016 grant programme related to nurse retention. The PhD study (the systematic reviews and two subsequent phases) specifically focused on the development and implementation of the intervention, providing a sound foundation for the final evaluation of the effectiveness of the intervention (not reported in this thesis). The evidence from the literature reviews underpinned the design of the intervention, which was co-produced with early career and student nurses, implemented, and evaluated in terms of feasibility and acceptability. The concept of transition shock was central to the rationale for the study and design of the

intervention. The intervention consisted of four interactive learning days that were in addition to the traditional programme of learning for final year student nurses. The content of the days included Acceptance and Commitment Training (ACT), reflective sessions to share and discuss experiences in practice settings, and a specific focus on skills required for transition such as dealing with stress, developing social networks, difficult conversations, and time management. Chapter 2, Chapter 4, and Chapter 5 in this thesis present three published papers that incorporate detailed discussions of the findings for the systematic review, phase 1 and phase 2 of the study. Consequently, this discussion chapter will present a synthesis of the findings from the multiple phases, followed by a broader discussion of specific areas related to the new knowledge that the PhD study has created. These areas of new knowledge are the use of co-production across clinical and academic settings, the importance of context to implementation, and new learning about intervention content to increase retention of early career nurses. The chapter will conclude with consideration of the strengths and weaknesses of this work followed by recommendations for nursing practice, education, and research, derived from the findings of all phases of work.

The preliminary stage of this study comprised of two literature reviews, the second of which was published, both conducted according to the PRISMA guidelines. The aims of the reviews relate to objective 1 for this PhD: to identify the components of interventions that have previously been shown to be successful at reducing turnover and increasing retention of early career nurses. There are two time points where these interventions can be implemented, either prior to graduation during the educational programme to prepare for and ease the transition into qualified practice, or immediately following qualification in the first year of qualified practice, therefore two reviews were necessary to identify:

3. The types and impact of interventions implemented during the undergraduate education programme to increase early career nurse retention; and
4. A systematic understanding of which components of interventions implemented in the first year after qualification contribute to their success.

Literature review 1 considered interventions implemented prior to graduation and synthesized findings from 33 papers. Six of the 33 studies included quantitative measurements of retention data, and were included in a systematic review. A further 27

papers qualitatively reported issues of transition and/or retention related to retention and were included in a narrative synthesis. The interventions were categorised under one of six descriptors: capstone project; internship; externship; preceptorship; psychological wellbeing programme; and other. The effectiveness of the interventions was mixed, and the findings indicated that if there are established and well-evaluated strategies already in place in the first few months following graduation, there may be less value to implementing additional interventions during the undergraduate period. Concerns about the quality of reporting and the absence of retention data limited recommendations about potentially successful interventions but findings suggest interventions that incorporate preceptors, expose students to the reality of the clinical environment, and involve collaboration between the academic and clinical institutions, report positive outcomes related to transition to qualified practice. Consideration should be given to the level of exposure students currently have to clinical practice, and the benefits that interventions with alternative approaches such as psychological wellbeing programmes may bring.

The second, published, review incorporated 53 papers, reporting a wide range of interventions. Some interventions were explored and reported by multiple studies in different contexts, strengthening the credibility of the conclusions that could be drawn. As with the first review, the quality of the review was necessarily limited by the quality of the study reports that were available, but inferences were made about characteristics that provided benefit. Types of interventions with some evidence of benefit included internship/residency programmes and orientation/transition to practice programmes, lasting between 27-52 weeks. The inclusion of a teaching component, and a preceptor and/or mentor component also appeared to be important. Having identified these components of interventions as effective, they can be used as a foundation for developing or refining transition programmes for early career nurses so that maximum return on investment is achieved. The findings will be of interest to healthcare organisations that employ early career nurses internationally. The fact that the review has been published and has been cited (58 times, ResearchGate 04.02.22), indicates that the findings have credibility and are of broad interest. The literature reviews also highlighted the absence of discussion of co-production of interventions, or the active involvement of recipients in their development, which influenced the design of this study.

Phase 1 of the empirical study involved co-production of the intervention and assessment of acceptability of the co-production process. This phase of the study relates to objectives 2, 3, and 4 for the PhD:

2. To explore how a group of early career nurses and student nurses use current evidence and experience to co-produce an intervention to increase retention and decrease turnover of early career nurses.
3. To explore the experiences of students and early career nurses during the co-production process.
4. To measure the acceptability and identify the factors that contribute to the acceptability of the co-production process.

Student nurses and early career nurses joined two academic facilitators to co-produce the intervention using the accelerated experience-based co-design model (Point of Care Foundation, 2021). The group met at City, University of London on six occasions to discuss the form and content of the intervention, culminating in a proposal of four additional days of interactive content to be delivered during the final year of the nursing programmes. The co-production process was evaluated from the perspectives of the group members and facilitators using questionnaires at three timepoints, analysis of reflective facilitator field notes, and semi-structured interviews after the process was completed. The evaluation focused on acceptability of co-production as a process to develop an intervention, as use of co-production to span both clinical and educational settings is novel. The results demonstrated that the process was generally acceptable and became more acceptable over time. At the beginning participants anticipated that the process would take effort and interfere with other priorities, but this was no longer their perception at the end of the process. Thematic analysis of data from the interviews indicated that participants benefitted personally from undertaking the process, developed communication skills that they used in clinical practice, felt an increased sense of wellbeing due to being able to take part in something that would help the next generation of nurses, and enjoyed using the group as a reflective space. Although the facilitators were acutely aware of navigating the tensions between individual benefit and study outputs, they also recognised personal gain from engaging with the process. Ultimately, the PhD objectives relating to phase 1 were achieved as the intervention was successfully designed and the findings offer new insight

about the use of co-production across academic and clinical settings. These findings are discussed in greater depth in the following sections of this discussion chapter.

Phase 2 of the empirical study involved a feasibility study of the implementation of the co-produced intervention. This phase of the study relates to objectives 5, 6, and 7 for the PhD:

5. To identify the barriers and facilitators to implementing the intervention.
6. To explore the experiences of students and staff during the implementation of the intervention.
7. To establish how the views of students and staff explain the measures of acceptability and feasibility of the intervention

Seventy-four students participated and seven academics were involved in the delivery of the four additional learning days in the nursing curriculum. Pre- and post-measures of acceptability were collected using questionnaires, and content from semi-structured interviews, focus groups and reflective field notes were analysed to further explore acceptability and feasibility. The intervention was perceived as generally acceptable with significant positive increases in acceptability scores over time. Student nurses perceived the intervention equipped them with skills and experience that offered enduring personal benefit, with extensive reference to the psychological skills training (ACT) that was embedded in the intervention. Challenges with feasibility related to the practice environment and academic assessment pressures that students felt whilst attending the intervention days, which manifested as a significant increase in perception that the intervention interfered with other priorities and non-significant increase in perception of effort to attend. The participants' responses indicated that substantial planning is required to successfully incorporate such an intervention into an established curriculum. The personal benefits that participants reported align with known protective factors against burnout and leaving the profession, emphasising the suitability of the intervention to support retention of early career nurses. Evaluating acceptability and feasibility of the intervention offered new knowledge about the value of the content and the conclusion that wider implementation was both recommended by participants and feasible. These findings indicate that the PhD objectives relating to phase 2 were met and the implications of the

findings are discussed in greater depth in this discussion section. The findings from all three papers are also summarised in Table 19.

The novelty of co-producing an intervention across academic and clinical settings, and the challenges and benefits this presented, warranted further exploration. Section 6.2 discusses the co-production process as experienced during this study and in the context of relevant extant literature. In section 6.3, the importance of context to successful implementation of interventions is acknowledged and discussed. The new knowledge that this study has provided regarding the development of interventions to increase early career nurse retention is explored in section 6.4, including the rationale for the final design. In all the remaining sections of the discussion chapter, reference is also made to organisational empowerment, as this is a coherent thread throughout the study.

Table 18 Summary of published papers and contribution to body of knowledge

Phase	Title	Methods	Main Findings	New contributions
Preliminary	Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: A systematic review Brook, J., Aitken, L., Webb, R., MacLaren, J. and Salmon, D. (2019). Characteristics of successful interventions to reduce turnover and increase retention of early career nurses: A systematic review. <i>International Journal of Nursing Studies</i>, 91, pp. 47–59. doi:10.1016/j.ijnurstu.2018.11.003.	The systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Studies were quality-assessed using the Joanna Briggs Institute Critical Appraisal tools for Quasi Experimental and Randomised Controlled Trials. Retention/turnover data were used to guide the comparison between studies and appropriate measures of central tendency and dispersion were calculated and presented, based on the normality of the data.	A total of 11, 656 papers were identified, of which 53 were eligible studies. A wide variety of interventions and components within those interventions were identified to improve nurse retention. Methodological issues impacted on the extent to which conclusions could be drawn, even though many studies were identified. Promising interventions appear to be either internship/residency programmes or orientation/transition to practice programmes, lasting between 27–52 weeks, with a teaching and preceptor and mentor component.	This was the first systematic review to consider the characteristics of interventions that contribute to their success. The identified characteristics can be used as a foundation for developing or refining transition programmes for early career nurses so that maximum return on investment is achieved. Evaluations of cost-effectiveness are an important next step to maximise return on investment.
1	Co-production of an intervention to increase retention of early career nurses: Acceptability and feasibility Brook, J., Aitken, L., MacLaren, J-A. and Salmon, D. (2020) Co-production of an intervention to increase retention of early career nurses: Acceptability and feasibility. <i>Nurse Education in Practice</i> 47 102861	This was a mixed methods study reporting on co-production of an intervention undertaken by nursing students, early career nurses and researchers. Data were collected prospectively, concurrently, and retrospectively via interview and questionnaire. Descriptive statistics were used to summarise quantitative results and interview content was thematically analysed.	Students and early career nurses reported personal benefit from participating; they developed and practised transferrable communication and problem-solving skills, believed they were able to make a difference, enjoyed contributing, found benefit from using the group as a reflective space and considered that co-production produced a credible intervention. Co-production was generally acceptable, and perceptions of acceptability increased over time.	This was a novel approach to co-production, spanning boundaries between nursing practice and higher education, and was the first use of co-production to design this type of intervention. Personal benefit from participating in co-production could enhance performance in clinical settings. Earlier and clearer explanations of co-production process for participants would be helpful.

2	An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility Brook, J., Aitken, L.M., MacLaren, J-A. and Salmon, D. (2021) An intervention to decrease burnout and increase retention of early career nurses: a mixed methods study of acceptability and feasibility BMC Nursing, 20:19 https://doi.org/10.1186/s12912-020-00524-9	This was an explanatory sequential mixed methods study. Pre and post measures of acceptability were collected from nursing student participants, by questionnaire. Wilcoxon Signed Ranks test was used to assess change in acceptability over time. Qualitative data from semi-structured interviews, focus groups (conducted following implementation) and field notes were thematically analysed.	The intervention was perceived as generally acceptable with significant positive increases in acceptability scores over time. Student nurses perceived the intervention equipped them with skills and experience that offered enduring personal benefit. Challenges related to the practice environment and academic assessment pressures, which impacted on attendance. Wider implementation was recommended by participants and perceived to be feasible.	Evaluating acceptability and feasibility of an intervention to increase retention offered new knowledge about the value of the content and facilitated the conclusions that this intervention was feasible and should be more widely implemented. The perceived benefits of the psychological skills-based intervention align with known protective factors against burnout and decisions to leave the profession. Challenges in the practice environment and pressures of academic assessment mean thorough planning and partnership working is essential to implementation.

6.2 Co-production across clinical and academic settings

The use of co-production in this study to develop the intervention was a novel approach and one which has offered new learning in relation to the use of the process across academic and clinical settings. The systematic reviews highlighted the absence of evidence of recipients being engaged in the development of interventions to increase retention of early career nurses. Co-production was therefore chosen as a method because of the alignment with Kanter's (1977) theory of organisational empowerment introduced in Chapter 1, and the potentially positive impact of empowering the students and early career nurses in their career choices (Fragkos, et al., 2020). Co-production was also consistent with the theoretical underpinning set out in Chapter 3.

The NHS and higher education institutes (HEIs) are very different organisations and have developed individual organisational cultures. These cultures had a profound impact on the process and outputs of this study by posing political and organisational challenges that in turn influenced the experience of the co-production and intervention participants. An explanation for these challenges can be framed by organisational empowerment theory, particularly the perspective that each organisation has inherent processes that relate to empowerment outcomes. Important to empowered organisations are the interorganisational relationships and collaborations (Zimmerman, 1995; Peterson and Zimmerman, 2004), the nature of which ultimately impact on the individual. Exploring organisational culture is also fundamental to understanding the influence of organisational processes on the workforce and relationships with other organisations.

Organisational culture can be defined as, "the accumulated shared learning of a group as it solves its problems of external adaptation and internal integration. [...] This accumulated learning is a pattern or system of beliefs, values, and behavioural norms that come to be taken for granted as basic assumptions and eventually drop out of awareness" (Schein and Schein, 2017, page 6). Some of the elements of organisational culture that Schein identifies are visible, but some are invisible, less tangible, and therefore difficult to quantify. In his original work, Schein proposed a model of organisational culture operating across three

tiers: artefacts, or the structure and processes of an organisation; espoused values, or the publicly expressed strategies, goals, and philosophies of the organisation; and underlying assumptions, or the shared values within an organisation, which are often unconscious (Schein, 1985). An alternative view is that of Deal and Kennedy (1982), who suggest that any organisation is founded on six core elements: history; values and beliefs; rituals and ceremonies; stories; heroic figures; and cultural networks. Together these construct the fictional and symbolic interpretations that form the reality of the cultural system.

Considering either interpretation, conflict may be present if processes are misunderstood, if espoused values do not match the perceptions of the workforce, or the values are ill-defined or invisible.

Whilst there is clarity that any NHS workplace culture should reflect the core values and principles of the NHS constitution (Department of Health and Social Care, 2015), high profile cases of poor healthcare practice such as those at Bristol Royal Infirmary (Kennedy, 2001), Mid-Staffordshire NHS Foundation Trust (Francis, 2013), and Morecambe Bay Hospitals NHS Trust (Kirkup, 2015) illustrate that there can be misalignment between the values of the organisation and the operationalisation of those values on the front line. There are implications for workforce practice, and ultimately patient care, when this misalignment is operationalised by those with leadership or management roles. This may lead to subcultures developing within an organisation (Lok, et al., 2011), which in the NHS may be evident in individual specialties, or wards, and will almost certainly be experienced by early career and student nurses.

Likewise, the organisational culture of a HEI is complex and dynamic. The functionality of a HEI such as City, University of London, will be influenced by a culture that is based on pre-existing narratives and practices, and can be a powerful force that guides and restrains behaviour (Serdenciuc, 2016). Universities play an important role in the contemporary infrastructure of knowledge, combining education, research, and socio-economic environment, and recently modern economic forces have marketised higher education in a political, ideological shift (Furedi, 2010). This shift has resulted in a set of paradoxical agendas that influence the priority placed on research, teaching, and enterprise within the system.

The co-production process in this study brought together group members embedded within either or both organisational cultures. Early career nurses would have successfully navigated the micro and macro cultures of their workplace environment, and potentially distanced themselves from the hierarchical lecturer/student culture of higher education. Nursing students were still subject to the university culture, but also becoming familiar with the NHS culture that they were experiencing through clinical placements and learning 'how things are done' in the NHS (Nightingale, 2018). The facilitators were equally conflicted by contrasting cultures. One facilitator was herself a nurse and so more familiar with NHS than higher education culture and the second brought higher education experience but no nursing familiarity. Each group member held preconceptions about 'the right way' to do things, based on their individual experience and socialisation into their organisation or profession's culture. Whilst this multiplicity of viewpoints is promoted as the value of co-production; the skill required to facilitate the convergence of these varied viewpoints towards a predetermined goal should not be underestimated. Facilitators were faced with navigating values and beliefs that were potentially invisible, unconscious, and socially embedded. Although likely to be firmly held, these values and beliefs may have been highly variable in the way they were expressed and consequently the skills required to facilitate co-production are arguably not the same as those traditionally required by academics in higher education (Flinders, et al., 2016). For co-production to become a mainstream process in HEIs, not only does there need to be investment in education and training to develop the skills but also recognition and valuing of those skills within the higher education systems.

The divergent cultures and the challenges to facilitation faced during the co-production process were key issues identified during this study. The facilitators reported feeling pressure to manage, and potentially influence, the co-production so that the pre-determined outcomes were met. The study was funded by an external agency and as such, there were expectations that deadlines would be met, and outputs achieved to preserve individual and organisational reputation. The project was heavily influenced by political pressures; politics that are often unrecognised or under-acknowledged because of the widely held belief that co-production is an inherently good thing (Flinders, et al., 2016).

The politics played out on several levels during the co-production process, and although not articulated as such by our participants, this added a degree of risk to the process that is identifiable with hindsight and was potentially exacerbated by the nature of the specific cross-organisational partnership that was fundamental to the study. The participants and the facilitators were undertaking innovative practice, but practice that was potentially in opposition to traditional views of knowledge generation (Gillard, et al., 2012). The facilitators were required to manage the expectations of the participants, the organisational partners, the investigators, and the funding body, and it was clear from the findings that the expectations of the different parties were not aligned. Funding agencies often require clarity about the issues to be investigated and about the study outcomes or outputs before funding is allocated, emphasising from the start the value placed on academic expertise. This has the potential to subvert the co-production process by placing a ceiling on the extent to which the balance of power between participants and facilitators can truly be equal (Flinders, et al., 2016).

In this study, the facilitators were acutely aware that they needed to co-produce an intervention to satisfy the funders and that the size and scope of that intervention was limited by available resource. The participants and facilitators did not, and could not, hold equal power because of the restrictions of the organisations that they worked with and for, and in that sense the process reasserted the traditional value placed on academic knowledge and the power differential between participants and facilitators. The issue of nurse retention was initially framed by policy makers and academics, and the intervention was ultimately shaped by the facilitators. They interpreted the contributions of the group members and translated those contributions into an intervention drawing on their own perceptions of what was relevant, important, and valuable, to find the 'best solution' within the limitations of the study (Turnhout, 2020). The facilitators did their utmost to embrace the ideas and contributions of the group members but felt this as a tension and found it the most difficult aspect of the process to manage. It may be that these hidden politics should be exposed to participants, with expectations managed accordingly, but if faced with the truth about the limitations of the process, participants may have engaged less enthusiastically or not at all. As it was, one student participant struggled to find a place in the process and felt that her views were undervalued, potentially because they did not align

with the scientifically sanctioned rationality or contribute to the ‘right’ results being delivered (Flinders, et al., 2016).

An additional layer of complexity with this study was highlighted in the section on reflexivity in Chapter 3 of this thesis (Section 3.5.1. Author Positioning). The paradoxical agendas of the higher education setting result in academic activity being subject to sometimes conflicting teaching and research incentives. The partnership with Barts Health NHS Trust was based on a valuable and essential educational relationship, layering more pressure on the study team to achieve collective success and avoid damage to the partnership (Oliver, et al., 2019). This impacted on consideration of more radical solutions to address change at organisational level rather than an individually focused intervention. Inadvertently, the complex nature of the partnership and the cultures of the two organisations may have reinforced the existing hierarchical structures of power rather than empowering the students and early career nurses (Turnhout, 2020).

Flinders, et al., (2016), present a typology of limits and risks in co-production, which has been developed in Table 20 to demonstrate how these political issues impacted on this study.

Table 19 Risks and limitations in the co-production of an intervention

(Adapted from Flinders, et al., 2016).

	Risks and Limitations	Impact on this study
Problem	Potential negative consequences of co-production process for researchers or partners. Institutional incentives that limit the achievement of the egalitarian aims of co-production, for example, emphasis on the recognition, valuing and rewarding of academic success (HEI) or clinical expertise (NHS) rather than all expertise being seen as equal.	• Potential risk of damage to educational partnership, which limited scope of the study • Potential exposure of sub-optimal practice and subsequent reputational damage (NHS and HEI) • Potential of failure to meet specified outputs with consequences for future funding, which impacted on extent to which power could be shared
Expectations	Research participants are implicated in relationships they are told will be equal but turn out to be unequal, thus creating an ‘expectations gap’ between rhetoric and reality.	• Potential and actual disengagement of co-production group members • Negative perceptions of acceptability initially, although positive perception increased over time.

		- Emotionally challenging for facilitators trying to navigate the tensions between optimal and sub-optimal engagement. - HEI setting reinforced expectations of hierarchical student/lecturer relationship and associated expectations of behaviour.
Power	Hierarchical structures can paradoxically be reinforced with co-production, because what is taken as 'good' local knowledge and who gets to decide what results are communicated, is determined by those in powerful positions.	- Study aims were framed by policy makers and academics, reinforcing the traditional power structures. - HEI setting reinforced expectations of hierarchical structures, with group members as passive recipients of knowledge. - Facilitators finalised the intervention based on their interpretation of the group contributions.
Value	Different research partners have different aims and goals for research outputs and standards of knowledge (epistemologies), with the effect of participants talking past each other and emergent professional tensions and frustrations.	- Facilitators felt pressure to develop the 'right' intervention to meet funder and partner need. - One group member felt undervalued as her contribution was not seen to meet the goal of the study. - Facilitators struggled to keep the process 'on track' to meet the (academically) pre-defined goals.
Validity	The validity of research findings may be limited by pressures from research funders (particularly in the private sphere) and by the researcher's own biased interpretation of the research findings themselves.	- Facilitators felt pressure to develop the 'right' intervention to meet funder need. - Intervention development was conducted by the two facilitators, with the potential risk of biased interpretation of co-production group members' contributions. - Evaluation helped validate the process as acceptability scores increased over time.
Pragmatism	Systematic involvement of all partners equally may not be feasible given basic constraints and disconnections between practitioner, public and academic languages / timescales / resources / incentives, etc.	- The process was necessarily time limited and did not allow for development of trust and relationships to the extent that may have optimised benefit. - Attendance at group meetings was difficult for group members. - Creativity was limited by resource available to implement the intervention. - Group members were paid to attend as an incentive.

The benefit of exploring these often-hidden aspects of co-production is two-fold. First, the added scrutiny allows exploration of whether and how the process would change in future studies, if indeed design and implementation changes can influence political and relationship tensions. Second, it allows an appreciation of the benefits of the process that were evident despite the political challenges that influenced the outcome. The evaluation of the co-production process indicated that it was seen by group members and facilitators as an acceptable way to develop an intervention, and that the process became more acceptable over time as the process evolved. By involving representatives from the group of nurses who were the intended beneficiaries in its development, the intervention was seen as more credible by those who received it. This was potentially because it was more 'implementation ready' (Oliver, et al., 2019) as the involvement of early career and student nurses allowed the study team to anticipate and accommodate the students' needs and priorities.

What was unexpected was the personal benefit that the group members and facilitators gained from engaging with co-production. Although there is a widespread perception that involving service users in research or service development is inherently a good thing to do (Oliver, et al., 2019), there is less compelling evidence about how this is realised and what the facilitators may be.

The findings from evaluation of the co-production process in this study indicated that engaging with the co-production group enhanced participants' feelings of confidence that they were able to contribute effectively to the group grew over time, engagement was seen as a positive activity as they felt they were doing 'something good' and contributing to the wellbeing of other students, and they also developed skills that they could then use in their clinical roles. This focus on wellbeing was also reflected in the intervention that was developed by the co-production group members, in particular the ACT element, which aimed to enhance psychological flexibility.

Kanter's (1977) structural theory of organisational empowerment emphasises the links between the individual, sources of power such as their relationships with fellow workers, and the centrality of their role to the purpose of the organisation. Drawing on this theory

helps to explain the findings from this phase of the study and make links to the implications for co-production across organisations. Co-production of the intervention was an intentional strategy to focus on participative processes and to develop a participative work climate; both are important for organisational empowerment (Spreitzer, 1996). However, given the cross-level relationship between wellbeing and functioning of people, and the structural qualities of organisations (Seibert, et al., 2011), the co-production process could be viewed as a manifestation of empowering practice. Individuals who engaged in the co-production process gained assets related to control over their own wellbeing and developed social capital that may have enduring benefit. Empowerment, self-determination, and feelings of wellbeing are all prerequisites of retention and job satisfaction, reiterating the alignment between co-production and the objective to retain nurses in the profession. The benefits of co-production, as implemented in this study, are summarised in Table 21.

While the benefits and challenges of the co-production process for the group members and the credibility of the intervention were apparent, it was also clear from the evaluation of feasibility and acceptability that the context of implementation was also critical to success. The importance of context is therefore discussed in more detail the following section of this chapter.

Table 20 Benefits of co-production

	Potential Benefit	Impact in this study
Psychological benefit	Participants may engage with co-production because the act of being a member of the group and carrying out the relevant tasks can yield experiences that provide psychological benefits independently of the nature of the other outputs created in the process (Etgar, 2008). Co-production can enhance interactions between ‘citizens and bureaucrats’ that are founded in trust (Needham, 2008).	• Participants and facilitators identified personal benefit from engaging with co-production, particularly related to helping future generations of nurses. • Most participants commented on the compassionate facilitation of the co-production sessions, which had the potential to lead to greater trust between academics and students and early career nurses.
Power	Seeking status and social esteem may be a motivation to engage in co-production (Holbrook, 2006). Group members join co-production communities and develop social networks (Achrol and Kotler, 2006), which may have enduring benefit. Co-production offers the opportunity for perceptions of greater control (Chan, et al., 2010).	• Early career nurses and students benefitted from reconnecting with each other and forming relationships that may have enduring benefit. • Students and early career nurses valued the opportunity to be able to influence the development of the intervention.
Value	The process may be of intrinsic value to participants, i.e., the process is valued for its own sake, or extrinsic value in that it enables participants to search for values such as excellence, or outcomes close to their expectations (Holbrook, 2006). Positive experiences of co-production may result in participants becoming more civically minded in other areas of their lives (Needham, 2008).	• Students valued the opportunity to influence their own transition into a qualified nurse role. • Early career nurses valued the opportunity to engage with the process to enhance their own development and to influence transition to practice. • All group members indicated that they would participate in co-production again.
Credibility	The product has the potential to be more credible from the perspective of those who use it. The product may be more ‘implementation ready’ (Oliver, et al., 2019).	• The intervention was seen as credible by the student nurses who received it due to the co-produced nature of the content.
Skill	Group members and facilitators may develop new skills when maintaining communication and dialogue with co-production partners (Ballantyne and Varey, 2006).	• Engaging with the co-production group enhanced participants’ sense of coherence • Engagement was seen as a positive activity as they felt they were doing ‘something good’ and contributing to the wellbeing of other students, • Participants developed skills that they could use in their clinical roles.

6.3 The importance of context to implementation

Evaluation of the implementation of the intervention indicated that, whilst the intervention was generally acceptable to the participants, significant barriers to attending the sessions were reported. Students enjoyed the intervention more over time, increasingly perceived that it was effective, felt the intervention fitted with their personal values, gained clarity and understanding about the intervention, and became more confident in their ability to take part. Contrary to the evaluation of acceptability of the co-production process, students also indicated that over time the opportunity cost of participating in the intervention became significantly greater, and perceived effort to participate trended towards an increase over time. Barriers were identified with attendance, ability to engage, and the timing of the intervention due to concurrent pressures with academic assessments. In addition, the practice environment, and in particular the attitudes of clinical colleagues, were seen to have a significant and influential role in the students' participation. Many of these barriers related to the context in which the intervention was implemented, and it is helpful to consider the importance of context in relation to implementation of innovations or interventions.

Context has been described as an "important but poorly understood mediator of change and innovation in healthcare organisations" (Dopson and Fitzgerald, 2005). Two recurring themes in the literature related to context are particularly relevant to explaining the findings in this study. These are references to the structure of the organisation, and the impact this has on implementation (Damschroder, et al., 2009), and to the culture of the organisation, and the impact this may have on behaviour, attitude, and hence successful implementation (Pfadenhauer, et al., 2017; Kitson, et al., 1998). Many of the barriers to attending the intervention days that students experienced were challenges with communication, confusion about the extent to which authority for decision making had been delegated within the healthcare organisation, and also timing of the intervention within the academic programme. In addition, cultural issues arose from perceived priorities linked to custom and practice, staff attitude, and distribution of power across both the healthcare organisation and HEI.

An enabling context is important for an innovation to thrive (Fixsen, et al., 2005), and infrastructure components such as organisational supports, competency supports for practitioners, and leadership capacity are influential for success (Blanchard, et al., 2017). Links with the healthcare organisation in this study were through a senior education leader, who delegated responsibility to other members of the Educational Team. In a large, multi-site organisation, there are many opportunities for communication break down and this is potentially why knowledge of the intervention at ward level was low and students experienced challenges with leaving the ward areas to attend. Relying on the leadership of one individual was a limiting factor in the development of organisational and competency support for the implementation.

Characteristics of an organisation such as the age, maturity, and size, together with both formal and informal networks and communications, have been highlighted as key components that need to be considered when implementing an intervention (Damschroder et al., 2009). The five geographically disparate sites that form Barts Health NHS Trust, and the challenges of communication to students and staff across those five sites are of particular significance to explaining the barriers they found to attendance.

Differential adoption of the intervention may also have been linked to contextual readiness for the implementation and organisational receptivity to change (Stetler, et al., 2011). An organisational incentive to support successful implementation of this intervention was the potential for increased retention of early career nurses, a strategic aim of the organisation that was influenced by a national agenda around nurse retention (NHSE&I, 2017). The organisation was clearly ready for change at strategic level, as the urgent need to address nurse retention had been recognised, and a sound evidence base had been established. However, this motivation may not have been as substantial at ward level due to the workforce coping with a range of priorities demanding equal or greater attention. The pressurised nature of the work integral to healthcare organisations, compounded by staff vacancies and increased workload demands due to patient and disease demographics, may have enhanced the reluctance of ward managers or supervisors to release students to attend the intervention days. It is therefore not surprising that the research was welcomed

at strategic leadership level, but perhaps not endorsed to the same extent at ward level, where the immediate needs of patient care were viewed as more pressing in the short term. This suggests that strategy and process may be interpreted differently by individuals or groups within the workforce (Pfadenhauer, et al., 2017).

Structural influences were not limited to the healthcare organisation, as the timing of the intervention in the academic programme was identified by participants as a consideration in their choice to attend. Although the co-production group identified the final year of the programme as the optimum time for delivery of the intervention, there was no consensus from students during the feasibility evaluation about when the intervention days would have been best placed in the curricula. Some participants welcomed the respite from clinical practice and finding the opportunity to reflect and apply practice-related skills developed during the intervention. Others felt the intervention would have been better placed during a period of theoretical input at the university to minimise disruption to clinical practice experience. Little is known about those students who chose not to attend the intervention sessions and remain in clinical practice, but it can be assumed that their choice was made to some extent because of a belief that remaining in placement would be more personally beneficial to them. There are known discrepancies between the importance and value attached to clinical practice experience by students and academics (AlThiga, et al., 2017) and this may have influenced the pragmatic decision to offer the intervention during a period of clinical placement activity. Given that UK students spend 50% of their programme in clinical practice, wider implementation would require careful advanced planning to manage the complexity of accommodating the intervention in an established nursing programme, avoid work overload and placement anxiety, and limit the impact on attendance. Certainly, greater consideration of environmental stressors (Michie, et al., 2005) such as assessment burden, may have increased the likelihood of successful implementation.

Organisational culture is a theme inherent in the literature as a determinant that shapes the context (Kitson, et al., 1998; Damschroder, et al., 2009). An organisational culture that incorporates high levels of learning, is patient centred, and values people, is more likely to support successful implementation of innovation. The Barts Health NHS Trust

organisational values certainly indicate an aspiration for their values to be visible in all interactions between patients, the workforce, and their partners (Barts Health NHS Trust, 2021). It may be that what the students were encountering were subcultures (Lok, et al., 2011) that had developed within the individual specialties or wards, not unexpectedly in such a large organisation, that then impacted on their perceived ability to attend the intervention days. Potentially it is the collective influence of cultural, organisational, and professional, mindsets that shape a dynamic interplay between the individual and the organisation that they work for (Damschroder, et al., 2009). Integral to that mindset are perceived norms, interests and affiliations and it is these perceptions at individual level that students encountered as barriers.

As discussed earlier in this chapter, the students were immersed in the two contrasting organisational cultures associated with the HEI and the NHS organisation. Some students felt unable to attend because the intervention sessions were not seen as a priority by their clinical colleagues, when weighed against the potential benefits of clinical experience. Mentors drew on 'custom and practice' to inform their attitude towards the intervention and releasing students to attend did not fit with their previous experience of final year student nurses, who traditionally formed an integral part of the workforce during their final few months of the programme. Staff belief about the implications of releasing the students were potentially twofold. First, the students would not experience the reality of nursing practice if they were in a HEI setting, and second, they would not be able to support delivery of patient care, resulting in additional burden on other clinical staff. Both areas of belief may have influenced decisions not to encourage students to attend the intervention. The power differential between the clinical staff and the students is a recognised, and not necessarily always positive, part of healthcare organisation workplace culture (Parker, et al., 2014; Cortina, et al., 2018). Negotiating the workplace culture is a critical part of the transition to qualified practice and has an influence on job satisfaction and retention in the role and profession (Brewer, et al., 2015; Daws, et al., 2020).

Individual human factors, including the potential influence of social, professional and role identity, belief about the consequences, and social influences or norms, (Michie, et al., 2005; Cane, et al., 2012) are particularly relevant to the implementation of the intervention,

impacting on both the staff and the students in this context. As indicated earlier in this section, the clinical learning environment is strongly influenced by organisational culture (Flott and Linden, 2016) and is in turn influential on students' self-confidence and decision making (Daws, et al., 2020). Students on a nursing programme are being socialised into the profession (Maben, et al., 2006) and as such adopt the norms and values that are espoused by their qualified colleagues. If supervisors, assessors, or managers in their placement areas do not value the intervention, they are likely to be influenced by that attitude and feel conflicted when asked to act in a way that is perceived to be outside of the social norm in the NHS setting, however acceptable that it might be in the HEI setting. This is particularly acute so close to their qualification, especially if ultimately, they would like to work for Barts Health NHS Trust. In addition, students reported feeling concern about leaving the busy ward areas at a time where there was high workload and patient need. They felt a loyalty to the ward area and the patients and as such, an organisational commitment. Ironically, for an intervention to increase retention of early career nurses, this potentially resulted in the students who felt the greatest organisational commitment to Barts Health NHS Trust, feeling the strongest emotional pull to stay on the wards rather than attend the intervention.

Organisational empowerment requires consideration of the internal structures and processes by which authority is distributed downwards (Kanter, 1977). The study findings indicate that this delegated authority was an important barrier to student attendance, as communication about the intervention was interrupted, subsequently impacting on knowledge, and understanding. Delegated authority to 'allow' the students to attend the intervention rested with individuals who were insufficiently informed to make that decision.

Students perceived that they were in a position that awarded them little agency or power, because they were reliant on staff in the ward areas to assess their competence in nursing practice. The assessors and managers in the placement area would ultimately decide whether they were competent to join the Nursing and Midwifery Council register, and in the face of such power imbalance, students perceived that they had little control over workplace decisions. This perception of lack of agency in decision-making is a central feature of organisational empowerment (Seibert, et al., 2011). A context where students

believed they did not have power and control potentially influenced their motivation to make decisions that may have had negative consequences. Ultimately, if their ambition was to work for Barts Health NHS Trust, their motivation to make a decision that they perceived may antagonise their future employers would have taken significant courage.

Context has been demonstrated to have had particular significance for the implementation of this intervention, taking account of organisational culture, structural processes and individual expectations and attitudes. Wider or further implementation of the intervention should involve careful consideration of these aspects of context to facilitate communication and attendance and maximise the potential impact on retention. The next section discusses the new learning from the study about developing interventions to increase early career nurse retention.

6.4 Developing interventions to increase early career nurse retention

The initial systematic reviews for this project identified characteristics of successful interventions to increase retention of early career nurses. Interventions implemented during the pre-registration nursing programmes to support transition to qualified practice and retention were considered and findings indicated that interventions with successful outcomes incorporate preceptorship, exposure to the reality of clinical practice as a nurse, psychological wellbeing mechanisms, and collaboration between academic and healthcare organisations. For interventions implemented following graduation, characteristics with positive effect included the intervention lasting 6-12 months, involvement of a mentor or preceptor but preferably both, and some taught elements (Brook, et al., 2019).

This evidence was shared with the co-production group members but the intervention that was co-produced in phase 1 and implemented in phase 2 of this study incorporated only some of these features; it was implemented in four, one day sessions, over a period of one month, without the inclusion of mentors or preceptors, however, it did incorporate a psychological wellbeing programme, and was grounded in the reality of early career nursing practice. One of the PhD study objectives was to explore how a group of early career nurses and student nurses used current evidence and experience to co-produce an intervention to

increase retention and decrease turnover of early career nurses. Consequently, it is useful to explore the rationale for the final design and content of the intervention in more depth.

As discussed earlier in this chapter, the intervention was deliberately co-produced with early career and student nurses. This approach was incorporated to maximise the potential influence on design and content by those individuals who would be likely to benefit from the intervention. It was also an approach that aligned with the study's underlying theoretical principles relating to empowerment. The first stage of the co-production process was to present the current evidence to the co-production group members so that they could develop the intervention from a sound evidence base. The findings from the systematic review were included in the evidence presented, yet these were not fully adopted by the co-production group. This may be explained, in part, by the presence of a theory-practice gap.

Theory-practice gap, reflected as the disparity between what is taught and what is practised in nursing (Gallagher, 2004) is a long-standing issue (Kramer, 1974; Maben, et al., 2006; Monaghan, 2015; Salifu, et al., 2019). As discussed in Chapter 1, a wide theory-practice gap can result in a reality shock for newly qualified nurses as they enter the profession and can be responsible for low job satisfaction and high turnover (Salifu, et al., 2019). One proposed explanation for the existence of this gap is professional and bureaucratic work conflict, or organisational sabotage (Maben, et al., 2006), where factors related to the principles and norms of the employing organisation conflict with those of the profession. Student nurses are taught professional values, ideals, and theory, such as implementing evidence-based practice, but as they are socialised into the profession whilst undertaking practice placements, they experience the reality of a resource constrained environment and few role models striving for those professional ideals (Salifu, et al., 2019; Nielson, et al., 2013). This disconnect can cause confusion, anxiety and stress for early career nurses, and impact on their levels of confidence and perceptions of self-efficacy (Monaghan, 2015). The theory practice gap may provide an explanation for why the co-production group members did not take full account of the evidence base when designing the intervention; they wanted to design an intervention that equipped them for their lived experience of the nursing practice context, and the structure and content was drawn from their collective reality, rather than informed by the systematic review findings. The findings reiterate the influence of

organisational differences and organisational culture (as discussed in section 6.2 and 6.3) on the student and early career nurses.

Organisational empowerment theory emphasises the influence of the employing organisation on an individual's perception of meaning, competence, and self-determination, and ultimately whether they feel empowered by the organisation (Spreitzer, 1996). This reiterates the importance of the co-production group members identifying content that resonated with their own experience. The co-production group identified specific areas of focus such as time management, dealing with stress, managing difficult conversations, and building social networks as important to the intervention. This content in turn had the potential to increase their confidence, competence, and ultimately the impact they could have in their clinical environment. Content that enhances feelings of personal empowerment in an organisation also has the potential to mediate between the structural characteristics of the organisation and the attitudes and behaviours that may lead to attrition from the profession (Seibert, et al., 2011). The intervention was more credible to those who co-produced it and those who participated in it because the reality of student and early career nurses' experiences was central to the design.

A significant element of the intervention was Acceptance and Commitment Training (ACT), delivered over three or four half days. The ACT approach was seen to be a good fit with the aims of the intervention because it helped the student nurses prepare for their transition to qualified practitioners and employment in a setting that would potentially challenge their perceptions of nursing practice. Essentially, it supported them to develop psychological flexibility and reconcile the theory-practice gap and the subsequent 'reality shock' (Kramer, 1974) associated with their experiences of late student and early career nurse practice. Participants reported scenarios featuring the professional-bureaucratic work conflict identified by Maben, et al., (2006). They described workload pressures, finite resources and staff burnout contributing to a context where support for them as learners or new nurses was often less than they had anticipated, leaving them feeling anxious, disappointed, and resentful. As students and early career nurses they were faced with deciding whether to continue to aspire to and advocate for the patient care they thought they should be giving or modify their ideals and values and adapt their behaviour to match that of what happens

in practice. ACT potentially provided them with the tools to accept a situation that they could not change and optimise their practice within the framework of what was possible (Allen, 2004).

The evidence synthesised in Chapter 2 discussed the beneficial effects of psychological wellbeing programmes to ease the transition from student to qualified nurse. Stress and anxiety are recognised as prevalent in cohorts of nursing students and early career nurses (Phillips, et al., 2017; Brandt, et al., 2017; Turner and McCarthy, 2017; Labrague, et al., 2018; Suresh, et al., 2012). This was further evidenced by students in this study when they shared their experiences during the interviews. However, there is limited evidence of psychological wellbeing interventions implemented in education programmes as a solution (Kenny, et al., 2021). The language students and early career nurses used with facilitators and researchers frequently alluded to stressful situations, feelings of pressure, and lack of control, suggesting that this was a significant issue that was foremost in their experience. The evidence base supporting ACT as a programme that promotes increased mindfulness, decreased experiential avoidance, and decreased perceived stress and burnout (Frogeli, et al., 2016), coupled with the positive feedback from students about the ACT element of the intervention, suggests that the co-production group decision to include this element in the intervention was valid. Certainly, consideration should be given to how incorporation in the pre-registration programme could be sustained.

Integral to the intervention days were reflective sessions where students were able to explore their practice experiences, raise concerns and issues, and gain support from peers and facilitators. Much of the discussion centred on perceptions of organisational support, self-efficacy, and associated anxiety about their own competence. Student nurses have been recognised as susceptible to suffering from stress during their academic programme (Blomberg, et al., 2014) and this continues into their early careers as nurses, with a documented pattern of loss of confidence (Maben, et al., 2006), drop in job satisfaction, and perception of extensive support needs during their first year of practice (Anderson, et al., 2009). Newly graduated nurses often feel that they require further support and mentoring after their transition or orientation programme has been completed (Almada, et al., 2004). This may be linked to unrealistic expectations or underestimation of their own ability

(Mooney, 2007) and they may leave the organisation in anticipation of greater support elsewhere.

Self-concept is a multidimensional construct that forms part of an individual's self-perception, interacting with self-esteem, self-knowledge, and social self. Although formed in childhood it can evolve in response to life experience and feedback from others to form a set of attitudes that an individual holds towards themselves (Burns and Dobson, 1984). It encompasses many characteristics that relate to different life areas, such as academic or professional self-concept, and relationships between self-concept and adjustment to stress have been identified (Lazarus and Folkman, 1984). Professional self-concept has been identified as having a negative relationship with burnout in nurses (Consiglio, et al., 2014; Peng, et al., 2014). Nurses' professional self-concept relates to the way that individual nurses see themselves in their work environment (Cowin, 2001) and those with negative self-concept may have low job satisfaction and perceive themselves as lacking in competence. However, perceived organisational support has been identified as an influencing factor (Chen, et al., 2005) and both high levels of perceived organisational support and positive self-concept are protective factors against burnout (Zhang, 2013). A more recent study (Cao, et al., 2016) indicates that professional self-concept has a mediating effect on the association between burnout and perceived organisational support in nurses, indicating that not only are interventions to enhance organisational support important, but also interventions to enhance self-concept. This intervention offered sessions on assertiveness and managing difficult conversations, time management, and managing stress, all aimed at developing perceptions of competence and enhancing self-concept for the participating student nurses.

Kanter's (1977; 1993) theory of structural empowerment includes identification of how organisational behaviour promotes empowerment. Support is an important facet of this behaviour, and employee empowerment occurs because of appropriate structural antecedents in an organisation, such as support or incentive processes for employees (Peterson and Zimmerman, 2004). This can manifest as social support, or the way employees feel they are supported emotionally when they are faced with challenges or difficulties at work (Peterson and Zimmerman, 2004). Benefits of social support are

employees feeling needed and valued (Forenza, 2017) and an increase in social capital (Forenza and Mendonca, 2017).

Development of social capital was identified as important to student nurses in this study because of the relationship between social capital, social networks, and belongingness in an organisation, and subsequent loyalty and retention of nurses (Heinen, et al., 2012). An organisation that promotes activities to develop social networks is likely to have processes that result in social support (Forenza, 2014). The intervention in this study included an interactive workshop focused on developing social networks, which encouraged students to identify the breadth and depth of their current networks and explore ways that they could expand those networks to develop social capital on qualification and entering the workforce. Social networks are facilitated by subgroup linkages, or the way different groups in an organisation are connected so that they can collaborate to meet organisational goals, grow, and become more effective (Christens, et al., 2014). These linkages can be stimulated by active implementation of opportunities for listening, reflection and social analysis, which aligned with the reflective sessions incorporated in the intervention, facilitated by the HEI. However, unless these activities are also perpetuated within the healthcare organisation to facilitate development of social power for students, increasing their social networks is likely to be a slow process, lacking in immediate reward. This aspect of the intervention may have been more effective if the sessions had been jointly facilitated by academic and healthcare organisation members so that the benefits would have been more likely to be sustained in the practice setting. Given the strong links between social support and sense of community (Christens and Lin, 2014), and subsequent links between sense of community and retention (Mbemba, et al., 2013; Buck, 2017), processes for social support and development of social capital would merit further development.

Despite the apparent disparity between the evidence base and the intervention, the co-designed content was relevant to increasing early career nurse retention; the ACT element focused participants on skills to reconcile their work environment with their personal values and offered strategies to enhance their psychological wellbeing, and the subject-specific interactive sessions offered students new knowledge to enhance their self-efficacy and self-concept, strengthened by reflective sessions. Introducing the concept of social capital and

guidance about developing social networks was also important as a mechanism to empower participants. Joint facilitation of the sessions by Barts Health NHS Trust nurses may have helped to embed the intervention and enhance the potential impact on the early career nurse workforce.

6.5 Strengths and Limitations

This study was the first of its kind to use co-production with students and early career nurses to develop an intervention to increase retention in the nursing workforce. The use of co-production across both clinical and academic sessions was a novel approach that increased the relevance of the findings to a wider audience. The process of co-production also enhanced the credibility of the intervention with those who were most likely to make choices to stay or leave the profession. An unexpected benefit for the co-production group members was the positive effect the process had on their wellbeing, their enhanced communication and problem-solving skills, and development of skills that enabled them to engage more effectively with the clinical environment. Gathering data from both participants and facilitators resulted in new learning about how co-production might be used effectively across clinical and academic settings, particularly about the impact of organisational structure and culture on the effectiveness of the process. The mixed methods evaluation of acceptability and feasibility led to a wide range of data collection, with the interview, focus group and reflective field notes contributing explanation and context to the survey data. The voices from a range of participants were captured, adding to the depth of the data and the trustworthiness of the conclusions that could be drawn. The decision to utilise the Theoretical Framework of Acceptability to design the data collection tools enhanced the structure of the survey data, enabled comparisons, and focused the data collection on the attitudes and opinions of the students and early career nurses who were central to the issue of nurse retention. This enabled understanding of the benefit of the content, drawing on theories of stress and wellbeing, and incorporating ACT.

There are also some limitations to the study that need to be acknowledged. First, this was a single site study, involving one HEI and one NHS healthcare organisation. The number of

participants in phase 1 and phase 2 of the study limit generalisability and, potentially, the transferability of the findings to new or wider settings. During the co-production process, attendance was lower at the end of the process than at the beginning and this may have reflected challenges with participation that were not captured in the end-point questionnaire. Those who decided not to continue to attend may have had different views of acceptability of the co-production process than those who did attend, however, the interview data helped to explain the context of the lower attendance. Attendance at the intervention was also lower than anticipated and little is known about the views of those who did not attend; again, the interview data offered some explanation for why engagement was challenging. Additional data from the healthcare organisation, capturing the perspectives of the nursing staff in the placement areas would have provided a more comprehensive view and potentially further understanding about the barriers to attendance.

Second, the co-production and the implementation processes were challenging due to the complexity of the relationship with the healthcare organisation. The politics of co-production were significant, and the implementation was influenced by expectations around positive outputs, the need to manage the relationships regarding educational agendas (as introduced in Chapter 1 and in Chapter 3, section 3.5.1., where reflexivity and author positioning was discussed) and the different priorities of the two organisations relating to education and patient care. These contextual issues significantly impacted on the study and highlighted the need to carefully consider relationships and context when collaborating.

Finally, the study is open to criticism at a fundamental level due to the individualistic nature of the intervention. The underpinning theoretical framework relates to organisational empowerment, the ethos of which is that the structural systems and processes of an organisation are the antecedents of empowerment for members of that organisation. Drawing on this perspective, there is a strong argument that interventions aimed at the individual are insufficient to influence early career nurse retention as it is the organisational characteristics that ultimately determine whether an individual decides to stay or leave. Although this perspective is acknowledged, there is also a compelling argument that

influencing the personal empowerment of the early career nurses will mediate between structural empowerment constructs and work-related attitudes and behaviours (Zimmerman, 1990), including turnover (Seibert, et al., 2011). The resources for this study did not allow for development of an organisation-wide intervention and the focus on the individual students was a pragmatic decision. Had the resources been greater, an intervention that focused on both the individual and the organisation would have been implemented. However, the findings indicate that both the co-production and the intervention equipped participants with skills and knowledge that had enduring personal and professional benefit, influencing their self-concept, their ability to cope with challenging clinical situations, and their acceptance of the workplace environment, justifying to some extent the individualistic approach of the study.

6.6 Recommendations

Several recommendations can be made from the findings of this study, relating to education, nursing practice and research. The recommendations are useful to inform further development of interventions to increase retention of early career nurses.

6.6.1 Education

Co-production of the intervention was a significant strength of this study and, despite the challenges to the process, the first recommendation is to expand the use of co-production in educational settings. Learning from phase 1 one of this study indicates that careful consideration is needed to ensure that the process meets full potential. Facilitation is central to enabling students to engage in a partnership with academics so that they understand the scope and limits of the process. Investment in education and training to enhance facilitation, including active listening, emotional literacy, and understanding of power dynamics and strategies to equalise power relationships is important. Academic recognition and valuing of the attributes required is also necessary to establish co-production as a key tenet of education projects. Given the transferrable skills that co-production members gained, increased co-production in education would support students

to meet the dynamic needs of the job market and this requires fundamental changes of attitude, roles and responsibilities to all stakeholders within academia (Athakkakath, et al., 2015). Clear and early explanation of what co-production entails, the intended outputs of the process, and what we now understand to be the potential personal benefits, are also central to maintaining meaningful engagement of co-production group members. Facilitators need to be cognisant of the politics of co-production to pre-empt and manage the pressure to achieve different outputs for different stakeholders and navigate a path towards a credible and mutually acceptable outcome (Oliver, et al., 2019). This is especially important when the co-production process involves two organisations with fundamentally different organisational cultures, so it is advisable to explore these differences prior to implementing co-production. Steering groups that allow open and honest prospective, concurrent, and retrospective discussion may be one way to mitigate political sabotage.

An acknowledged limitation of the study was the small study population, however, there was strong support from participants for more extensive implementation of the intervention. Despite perceptions of increased burden and opportunity cost, those interviewed were unanimous in recognising the future potential of the intervention to support student and early career nurses. Although there was no consensus about when the intervention should be implemented in the pre-registration curriculum, the skills and knowledge that students gained from the ACT elements of the programme would be beneficial at an earlier point. Consequently, a second recommendation is to incorporate ACT into the first year of the pre-registration nursing curriculum, preferably as a contribution to the preparation for students' first experience of clinical practice. Subsequently, ACT should be revisited periodically in the nursing programme, to reinforce the skills that will support students to reconcile the differences between their expectations and the reality of the clinical environment. On qualification, early career nurses' psychological flexibility will be a well-established feature of their professional approach and can be drawn upon to support their transition into the nursing workforce (Lloyd, et al, 2013). Wider implementation would require careful planning to manage the complexity of accommodating the intervention in an established nursing programme, avoid work overload for facilitators and students, and maximise attendance.

6.6.2 Practice

The findings from this study have exposed the complexities of relationships between organisations (Peterson and Zimmerman, 2004). Participation in and focus on building alliances between organisations positively influences collaboration and may allow access to social networks if permitted by the organisational processes of the lead organisation (Evans, et al., 2011; Javdani and Allen, 2011). Undoubtedly, successful alliances are built on successful facilitation, effective leadership, and communication both across and within organisations, which in turn leads to capacity building across institutional boundaries (Janssen, et al., 2015; Ramgard et al., 2017). What was lacking in the implementation of the intervention in this study was a flexible model of building bridges across institutions, with reliance the direct link between the HEI and healthcare organisation. As is often the case, internal affairs were prioritised above inter-organisational collaboration, which led to reprioritisation of the intervention and breakdown in communication. Empowering settings can be enhanced by reforming them (Maton, 2008) and consequently a third recommendation is for nursing practice and HEI partners to consider how to develop more strategic relationships within a range of different healthcare contexts. This in turn will maximise potential for successful collaboration, enhance channels for communication and allow access to social networks that have the potential to develop individual and organisational effectiveness. For wider implementation of the intervention, preparatory work is essential to embed understanding about the value of the intervention and facilitate prioritisation. Consideration should be given to both student and NHS colleagues' commitments to maximise engagement and work in partnership.

The findings from the implementation phase of the study indicated that the intervention was helpful to students' adjustment to the reality of the clinical setting, but that implementation was challenged by the perceived power differences between students and their assessors in the practice setting. The political environment is influential to successful implementation; more than a backdrop, the characteristics and circumstances within which the intervention is embedded can interact, modify, facilitate, or constrain implementation (Pfadenhauer, et al., 2017). A fourth recommendation is for practice areas to explore the organisational culture and subcultures that perpetuate a context of anxiety, fear, and

disempowerment for students. Students frequently referred to stress and pressure, so it may be useful for placement areas to identify the organisational and individual stressors in their clinical environments to enhance students' experience.

The organisational development benefits of ACT have been demonstrated extensively in several studies (Lloyd, et al., 2013; 2017; Wardley, et al., 2014; Heydari, et al., 2018) and have been reiterated by the findings of this study. ACT programmes with a duration of as little as one day have been shown to have beneficial effects on the mental health of distressed healthcare workers (Waters, et al., 2018). A final recommendation is the implementation of similar psychological skills training for qualified nursing staff in clinical areas to support retention of the current workforce. If this was implemented in parallel with ACT as part of the pre-registration nursing programme, the common learning and focus on a commitment to values driven behaviour would have the potential to impact on workplace culture.

6.6.3 Research

This was a single site study and as such there are limitations on generalisability of the findings. Further research to implement the intervention in multiple settings with a greater number of participants is a strong recommendation. The evaluation of feasibility and acceptability has constructed a platform of knowledge to underpin wider implementation on multiple sites, which will clarify the optimal conditions for successful implementation and offer opportunity to explore the synergistic effects of relationships. In addition, the next stage of this study was an evaluation of effectiveness of the intervention, exploring whether the intervention did indeed have a positive effect on early career nurses. This was conducted as part of the wider, Burdett Trust for Nursing funded study, using measures of psychological wellbeing, burnout, orientation to work, and retention to establish effect. Wider implementation and testing for effectiveness require power and sample size estimations to ensure the research enables inferences to be made about the impact of the intervention on retention of the wider population of early career nurses. Further effectiveness research would require a larger number of participants across multiple sites. Critical to wider implementation is examination of the organisational characteristics of new

sites so that similarities and differences, and their impact on implementation could be assessed.

The students highlighted multiple barriers to engaging with the intervention, but the study methods did not incorporate a mechanism to establish whether these barriers were hypothetical or perceived, or whether they were actual issues (Nilson, 2015). In relation to the lived experience of the students it is not necessary to make a distinction between hypothetical or actual barriers, however, it is important to be able to distinguish those barriers that can be overcome to revise the intervention or implementation for greater effect. One mechanism to gain further insight into the context and ascertain whether the perceptions of the students were different from those of the staff in the clinical environment, is to incorporate the views of the nurses, managers, and educators into evaluation of feasibility and acceptability. Interviewing established members of the workforce would expose any paradoxical viewpoints and offer opportunities to explore the impact of context on perception of barriers and facilitators to intervention implementation.

An additional area for further research is the impact of the development of social capital on early career nurse retention. This study identified challenges with students developing social capital across two different organisations but given the established links between social capital and empowerment, belongingness, and retention (Rothman, et al., 2019; Heinen, et al. 2012), further collaborative research to explore mechanisms to overcome those challenges is recommended. As part of the wider, Burdett Trust for Nursing funded study, the application of methods to measure and learn from social networks has been conducted and is in the process of being evaluated.

6.7 Conclusion

In conclusion, this study aimed to develop an intervention to increase retention of early career nurses, using co-production. Components of the study included measuring the feasibility and acceptability of using co-production to develop the intervention, and the acceptability and feasibility of implementation of the intervention from the perspectives of

academics and students. The study was underpinned by organisational empowerment theory, which guided the design, implementation, analysis, and interpretation of the data.

Initially, two systematic reviews were completed, providing a sound evidence-base for subsequent phases. The reviews explored optimum time points for delivery of interventions and indicated that there was evidence to suggest that prior to graduation, including preceptorship elements and focusing on psychological wellbeing may be of merit. Post qualification, orientation to practice programmes of 27-52 weeks in length, including a mentor or preceptor and structured teaching, held promise for increasing retention of early career nurses. Phase 1 of the empirical study involved the co-production of the intervention with a group of early career nurses and final year nursing students. The co-production process was evaluated in terms of acceptability and feasibility and not only was an intervention successfully co-produced, but the group members practised and developed communication and problem-solving skills that were transferrable to their nursing roles. An unexpected benefit was the enhancement of participant wellbeing during the co-production process. Participants recognised and enjoyed being able to make a difference and found benefit from using the group as a reflective space. They perceived the product as more credible because it reflected their lived reality of transition into a qualified nursing role. This added value of co-production equipped and motivated the group members to function more effectively in their nursing roles and is a persuasive rationale for incorporating co-production into the development of future interventions. Co-production has utility in relation to retention of early career nurses, as the findings indicate that inclusion of those most likely to leave the profession or their role will engender a more positive perspective towards their professional activity.

Phase 2 of the study involved implementing the intervention and evaluating it in terms of feasibility and acceptability. The study was designed in recognition of the importance of intervention acceptability to successful implementation, and subsequent exploration of the barriers to attendance identified the critical role of context in successful implementation of innovation. The findings indicated that not only was the intervention perceived as acceptable, but the positive perception increased over time, and the personal benefits

reported by participants align with known protective factors against burnout and decisions to leave the profession.

The findings from both phases of the study offer new knowledge in relation to co-production across clinical and academic settings, and the design and implementation of interventions to increase retention of early career nurses. Wider implementation of the intervention will require careful planning to take account of differences in higher education and healthcare organisational culture, and the processes that will empower student and early career nurses to make informed career decisions.

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8. Appendices

Appendix 1: Health Research Authority ethical approval letter



Professor Debra Salmon
Dean, School of Health Sciences
City, University of London
Northampton Square
London
EC1V 0HB



Email: [REDACTED]

21 June 2018

Dear Professor Salmon

**HRA and Health and Care
Research Wales (HCRW)
Approval Letter**

Study title: The Burdett Trust Early Career Nurse Retention and Burnout Study
IRAS project ID: 245992
Sponsor City, University of London

I am pleased to confirm that [HRA and Health and Care Research Wales \(HCRW\) Approval](#) has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

How should I continue to work with participating NHS organisations in England and Wales?
You should now provide a copy of this letter to all participating NHS organisations in England and Wales, as well as any documentation that has been updated as a result of the assessment.

Participating NHS organisations in England and Wales **will not** be required to formally confirm capacity and capability before you may commence research activity at site. As such, you may commence the research at each organisation 35 days following sponsor provision to the site of the local information pack, so long as:

- You have contacted participating NHS organisations (see below for details)
- The NHS organisation has not provided a reason as to why they cannot participate
- The NHS organisation has not requested additional time to confirm.

You may start the research prior to the above deadline if the site positively confirms that the research may proceed.

If not already done so, you should now provide the [local information pack](#) for your study to your participating NHS organisations. A current list of R&D contacts is accessible at the [NHS RD Forum](#)

[website](#) and these contacts MUST be used for this purpose. After entering your IRAS ID you will be able to access a password protected document (password: [REDACTED]). The password is updated on a monthly basis so please obtain the relevant contact information as soon as possible; please do not hesitate to contact me should you encounter any issues.

Commencing research activities at any NHS organisation before providing them with the full local information pack and allowing them the agreed duration to opt-out, or to request additional time (unless you have received from their R&D department notification that you may commence), is a breach of the terms of HRA and HCRW Approval. Further information is provided in the "summary of assessment" section towards the end of this document.

It is important that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details of the research management function for each organisation can be accessed [here](#).

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?

HRA and HCRW Approval does not apply to NHS/HSC organisations within the devolved administrations of Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) has been sent to the coordinating centre of each participating nation. You should work with the relevant national coordinating functions to ensure any nation specific checks are complete, and with each site so that they are able to give management permission for the study to begin.

Please see [IRAS Help](#) for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?

HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to [obtain local agreement](#) in accordance with their procedures.

What are my notification responsibilities during the study?

The attached document "*After HRA Approval – guidance for sponsors and investigators*" gives detailed guidance on reporting expectations for studies with HRA and HCRW Approval, including:

- Registration of Research
- Notifying amendments
- Notifying the end of the study

The [HRA website](#) also provides guidance on these topics and is updated in the light of changes in reporting expectations or procedures.

I am a participating NHS organisation in England or Wales. What should I do once I receive this letter?

You should work with the applicant and sponsor to complete any outstanding arrangements so you are able to confirm capacity and capability in line with the information provided in this letter.

The sponsor contact for this application is as follows:

IRAS project ID	245992

Name: [REDACTED]

Tel: 0207 040 5704

Email: [REDACTED]

Who should I contact for further information?

Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **245992**. Please quote this on all correspondence.

Yours sincerely

[REDACTED]
Assessor

Email: [REDACTED]

Copy to: [REDACTED], City, University of London [Sponsor Contact]
[REDACTED]
[REDACTED] Barts Health NHS Trust [Lead NHS R&D Contact]
[REDACTED]

School of Health Sciences
Opportunity to be involved in a research project aimed at nurse retention

Title of study: Burdett Trust Early Career Nurse Retention and Burnout Study

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The project aims to design and implement a new intervention to support student nurses to transition to staff nursing posts and to encourage them to continue working at Barts Health for their first year as a registered nurse and beyond. The project is a partnership between City, University of London and Barts Health NHS Trust and is funded by the Burdett Trust for Nursing. The three year project involves Professor Debra Salmon (Dean) and academics from the School of Health Sciences at City, University of London and involves designing and implementing an intervention to support newly qualified nurses. You will already have been involved in the co-production group that designed the intervention to increase retention and decrease burnout of these early career nurses in Barts Heath NHS Trust. This information sheet relates to the co-production part of the study and an evaluation of the process that you took part in.

General data protection regulations

City, University of London is the sponsor for this study based in England. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. City, University of London will keep identifiable information about you for 3 months after the study has finished, and all other non-identifiable data for 10 years.

We will ask you provide detail of your age, gender and ethnicity. Ethnic group is classed as special category data and we will need your explicit consent to collect this.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already

obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting Anna Ramberg, Research Governance & Integrity Manager (Anna.Ramberg.1@city.ac.uk).

City, University of London will use your name, and contact details to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Individuals from City, University of London and regulatory organisations may look at your research records to check the accuracy of the research study. The only people in City, University of London who will have access to information that identifies you will be people who need to contact you to arrange for you to take part in the study or audit the data collection process. The people who analyse the information will not be able to identify you and will not be able to find out your name, or contact details.

City, University of London will keep identifiable information about you from this study for 3 months after the study has finished and all other data for 10 years.

Why have I been invited?

You have been invited to take part because you were a member of the co-production group that designed the intervention for the Nurse Retention and Burnout Study.

Do I have to take part?

No, you don't have to take part. Participation is voluntary, and even if you decide to become involved, you may withdraw at any stage, or avoid answering questions which you feel are too personal or intrusive. If you decide not to take part or to withdraw, this will not affect your relationship with any staff members here at City, University of London or impact on your studies or grades in any way.

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

Once the data has been anonymised or published you will no longer be able to withdraw your data.

What will happen if I take part?

You will be invited to take part in one interview of approximately 30-60 minutes long, depending on how much you have to say. The interview will be either face-to face or on the

telephone and will be conducted by a member of the research team. The interview will focus on your experiences as a member of the co-production group and what your perspectives were on the co-production process.

Expenses and Payments (if applicable)

We can meet you at your workplace or at City, University of London for the interview if you prefer to be interviewed face-to-face. If you need to travel to do this, we can reimburse your travel. In recognition of your time, you will be offered online vouchers to the same denomination that you received when you participated in the co-production group.

What do I have to do?

If you are willing to take part in this part of the study you will be asked to sign a consent form and then you will be invited to arrange the interview at a time and place that is convenient to you.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks to taking part.

What are the possible benefits of taking part?

This is an opportunity to be part of a research project that feeds into the Barts Health Nursing, Midwifery and Allied Health Practitioner research strategy, led by Caroline Alexander, Chief Nurse. You would be participating in a project that will make a significant contribution to the ongoing development and practice experience of student nurses and newly qualified nurses as they settle in to their first year as a registered nursing.

What will happen when the research study stops?

Audio files of interviews will be destroyed as soon as the interviews have been transcribed. Once the research study has finished, any personal data (e.g. names, placement detail) will be deleted within 3 months and all other data will be archived for ten years as per City, University of London data retention policy, then destroyed. Your data will only be used in the ways that are outlined on the consent sheet and for no other purpose.

Will my taking part in the study be kept confidential?

If you consent to take part in the study you will be assigned a participant number that will be linked to all the data you provide, instead of your name. Your permission will be sought to audio record any conversations that take place. Audio recorded data will be transcribed by a third party, usually an independent transcriber, and will at this point be anonymised by assigning a research number to your transcripts. If the transcriber does not work at City, University of London, there will be a confidentiality agreement in place with him or her. Only the research team will hear the recorded data and the transcripts. If quotes from your

interviews are used in subsequent publications, the research team will ensure that you cannot be identified from the quotes.

Hard copies of transcripts will be stored in a locked filing cabinet at City, University of London. Electronic copies of transcripts will be stored on an encrypted computer that is password protected. All data (in an anonymised form) will be archived for 10 years at the end of the study and then destroyed as per City, University of London policy.

Your discussions will be kept confidential unless you disclose unsafe practice that may cause harm to a patient, yourself or colleague, at which point the researcher would be required to share your disclosure with the relevant practitioner at Barts Health NHS Trust.

What will happen to results of the research study?

The results of the research study will be presented to Barts Health Executive Team both orally and as a report and will be published on the Barts Health Nursing, Midwifery and Allied Health Professionals Research Group (NMAHP) website (<https://bartshealth.nhs.uk/nmahp-research>) by August 2019. The report may also be available for you to access from the City, University of London website. It is anticipated that the findings will be published in an academic journal and may be presented at appropriate conferences.

What will happen if I do not want to carry on with the study?

You are free to withdraw from the study without an explanation or penalty at any time.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City, University of London's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Burdett Trust Early Career Nurse Retention and Burnout Study

.....
You could also write to the Secretary at:

Research Governance & Integrity Manager
Research & Enterprise
City, University of London
Northampton Square
London
EC1V 0HB

Email:

City, University of London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Who has reviewed the study?

This study has been approved by City, University of London School of Health Sciences Research Ethics Committee

Further information and contact details (Redacted)

Data Protection Privacy Notice: What are my rights under the data protection legislation?

City, University of London is the data controller for the personal data collected for this research project. Your personal data will be processed for the purposes outlined in this notice. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees.

Further, City considers the processing of special category personal data will fall under Article 9(2)(g) of the GDPR as the processing of special category data has to be for the public interest in order to receive research ethics approval and occurs on the basis of law that is, inter alia, proportionate to the aim pursued and protects the rights of data subjects.

The rights you have under the data protection legislation are listed below, but not all of the rights will be apply to the personal data collected in each research project.

- right to be informed
- right of access
- right to rectification
- right to erasure
- right to restrict processing
- right to object to data processing
- right to data portability
- right to object
- rights in relation to automated decision making and profiling

For more information, please visit www.city.ac.uk/about/city-information/legal

What if I have concerns about how my personal data will be used after I have participated in the research?

In the first instance you should raise any concerns with the research team, but if you are dissatisfied with the response, you may contact the Information Compliance Team at dataprotection@city.ac.uk or phone 0207 040 4000, who will liaise with City's Data Protection Officer Dr William Jordan to answer your query.

If you are dissatisfied with City's response you may also complain to the Information Commissioner's Office at www.ico.org.uk

Thank you for taking the time to read this information sheet.

School of Health Sciences
Opportunity to be involved in a research project aimed at nurse retention

Title of study: Burdett Trust Early Career Nurse Retention and Burnout Study

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

You will be familiar with the project aims to design and implement a new intervention to support student nurses to transition to staff nursing posts and to encourage them to continue working at Barts Health for their first year as a registered nurse and beyond. The project is a partnership between City, University of London and Barts Health NHS Trust and is funded by the Burdett Trust for Nursing. The three-year project involves academics from the School of Health Sciences at City, University of London and involves designing and implementing an intervention to support newly qualified nurses. You have already been involved in the co-production group that designed the intervention to increase retention and decrease burnout of these early career nurses. This information sheet relates to the co-production part of the study.

Why have I been invited?

You have been invited to take part because you facilitated the co-production group that designed the intervention for the Nurse Retention and Burnout Study.

Do I have to take part?

No, you don't have to take part. Participation is voluntary, and even if you decide to become involved, you may withdraw at any stage, or avoid answering questions which you feel are too personal or intrusive. If you decide not to take part or to withdraw, this will not affect your relationship with any staff members here at City, University of London or impact on your studies or grades in any way.

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

Once the data has been anonymised or published you will no longer be able to withdraw your data.

What will happen if I take part?

You will be invited to take part in one interview of approximately 30-60 minutes long, depending on how much you have to say. The interview will be either face-to face or on the

telephone and will be conducted by a member of SHS research staff, who has not been involved in the Burdett trust project. The interview will focus on your experiences as a facilitator of the co-production group and what your perspectives were on the co-production process.

Expenses and Payments (if applicable)

We will conduct the interviews on a day when you are working at City, so no additional expenses should be incurred.

What do I have to do?

If you are willing to take part in this part of the study you will be asked to sign a consent form and then you will be invited to arrange the interview at a time and place that is convenient to you.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks to taking part.

What are the possible benefits of taking part?

This is an opportunity to enhance a research project that feeds into the Barts Health Nursing, Midwifery and Allied Health Practitioner research strategy, led by Caroline Alexander, Chief Nurse. You would be participating in a project that will make a significant contribution to the ongoing development and practice experience of student nurses and newly qualified nurses as they settle in to their first year as a registered nursing.

What will happen when the research study stops?

Audio files of interviews will be destroyed as soon as the interviews have been transcribed. Once the research study has finished, any personal data (e.g. names, placement detail) will be deleted within 3 months and all other data will be archived for ten years as per City, University of London data retention policy, then destroyed. Your data will only be used in the ways that are outlined on the consent sheet and for no other purpose.

Will my taking part in the study be kept confidential?

If you consent to take part in the study you will be assigned a participant number that will be linked to all the data you provide, instead of your name. Your permission will be sought to audio record any conversations that take place. Audio recorded data will be transcribed by a third party, usually an independent transcriber, and will at this point be anonymised by assigning a research number to your transcripts. If the transcriber does not work at City, University of London, there will be a confidentiality agreement in place with him or her. Only the researcher who conducts the interview will hear the recorded data and see the transcripts. If quotes from your interviews are used in subsequent publications, the research team will ensure that you cannot be identified from the quotes.

Hard copies of transcripts will be stored in a locked filing cabinet at City, University of London. Electronic copies of transcripts will be stored on an encrypted computer that is password protected. All data (in an anonymised form) will be archived for 10 years at the end of the study and then destroyed as per City, University of London policy.

Your discussions will be kept confidential unless you disclose unsafe practice that may cause harm to a patient, yourself or colleague, at which point the researcher would be required to share your disclosure with the relevant practitioner at Barts Health NHS Trust.

What will happen to results of the research study?

The results of the research study will be presented to Barts Health Executive Team both orally and as a report and will be published on the Barts Health Nursing, Midwifery and Allied Health Professionals Research Group (NMAHP) website (<https://bartshealth.nhs.uk/nmahp-research>) by August 2019. The report may also be available for you to access from the City, University of London website. It is anticipated that the findings will be published in an academic journal and may be presented at appropriate conferences.

What will happen if I do not want to carry on with the study?

You are free to withdraw from the study without an explanation or penalty at any time.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City, University of London's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Burdett Trust Early Career Nurse Retention and Burnout Study

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City, University of London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Who has reviewed the study?

This study has been approved by City, University of London School of Health Sciences Research Ethics Committee

Further information and contact details (Redacted)

General data protection regulations

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Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting XXXX, Research Governance & Integrity Manager.

City, University of London will use your name, and contact details to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Individuals from City, University of London and regulatory organisations may look at your research records to check the accuracy of the research study. The only people in City, University of London who will have access to information that identifies you will be people who need to contact you to arrange for you to take part in the study or audit the data collection process. The people who analyse the information will not be able to identify you and will not be able to find out your name or contact details.

City, University of London will keep identifiable information about you from this study for 3 months after the study has finished and all other data for 10 years.

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Further, City considers the processing of special category personal data will fall under Article 9(2)(g) of the GDPR as the processing of special category data has to be for the public interest in order to receive research ethics approval and occurs on the basis of law that is, inter alia, proportionate to the aim pursued and protects the rights of data subjects.

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- right of access
- right to rectification
- right to erasure
- right to restrict processing
- right to object to data processing
- right to data portability
- right to object
- rights in relation to automated decision making and profiling

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What if I have concerns about how my personal data will be used after I have participated in the research?

In the first instance you should raise any concerns with the research team, but if you are dissatisfied with the response, you may contact the Information Compliance Team at dataprotection@city.ac.uk or phone 0207 040 4000, who will liaise with City's Data Protection Officer Dr William Jordan to answer your query.

If you are dissatisfied with City's response you may also complain to the Information Commissioner's Office at www.ico.org.uk

Thank you for taking the time to read this information sheet.

Appendix 4: Phase 1 co-production group members and facilitators consent form



Title of study:

Burdett Trust Early Career Nurse Retention and Burnout Study

Please initial EACH box

1.	I confirm that I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records. I understand this will involve: • Participating in an interview by the researcher on one occasion • allowing the interview to be audiotaped	
2.	This information will be held by City as data controller and processed for the following purposes: • to help us understand your experience and views of the implementation of the intervention with nursing students for the Burdett Trust Nurse Retention and Burnout Study • to include in findings that will be presented to the Executive of Barts Health NHS Trust • to include in findings that may be presented at conferences and/or published in academic journals. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees. I understand that the following special category data will be collected and retained as part of this research study: ethnic origin. City considers the processing of special category personal data will fall under: Article 9(2)(g) of the GDPR as the processing of special category data has to be for the public	

	interest in order to receive research ethics approval and occurs on the basis of law that is, inter alia, proportionate to the aim pursued and protects the rights of data subjects and also under Article 9(2)(a) of the GDPR as the provision of these personal data is completely voluntary. I understand that any information I provide is confidential, unless I disclose unsafe practice that may result in harm to me, patients or my colleagues. No information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published. The identifiable data will not be shared with any other organisation.	
3.	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.	
4.	I agree to City, University of London recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on City, University of London complying with its duties and obligations under the General Data Protection Regulation (GDPR).	
	I understand that relevant sections of data collected during the study, may be looked at by individuals from City, University of London, from regulatory authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my anonymised data.	
5.	I agree to the use of anonymised quotes in publication.	
6.	I agree to take part in the above study.	

Name of Participant

Signature

Date

Name of Researcher

Signature

Date

Appendix 5: Phase 1 acceptability questionnaire

The acceptability questionnaire was administered at the beginning, middle and end of the co-production process. The questions were changed to reflect the temporal nature of the questionnaire. The example below is the end point questionnaire and hence refers to the co-production process in the past tense.

Acceptability Questions for Co-Production Group – end point

Participants were asked to circle or underline the answer that best suited their opinion from the following options:				
Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5
Questions asked:				
1.	I felt it was acceptable for me to take part in the co-production process.			
2.	I enjoyed taking part in the co-production group meetings.			
3.	It required effort for me to take part in the co-production group sessions.			
4.	The co-production process was effective to design an intervention to help retain early career nurses.			
5.	I valued the co-production process as a way of designing an intervention.			
6.	Participating in this co-production group interfered with my other priorities.			
7.	I am confident that I was able to contribute to the co-production process.			
8.	I understood the co-production process and how it works.			

Appendix 6: Phase 1 interview guide

The interviews were semi-structured, so the questions were a guide, and the interviewer chose to probe more deeply into areas of interest by using prompts and additional questions that were relevant to the conversation.

Questions included:

The Co-production process:

Please tell me about your experience of being part of the co-production group.

Do you think co-production is an effective way of developing an intervention to encourage retention of early career nurses? Why?

What did you enjoy most about the co-production process?

Were there any challenges to engaging with the co-production process and if so, what were they?

How useful was the video at the beginning of the co-production process? Why?

Were any of the exercises more effective/enjoyable/relevant than any others? Which ones and why?

Would you engage with co-production again if you were offered the opportunity?

Personal development:

Did you learn any transferrable skills during the co-production process?

If yes, what were these?

In what context would you anticipate using these skills in the future?

Power dynamics

To what extent did you feel that you were able to speak up in the co-production sessions?

Did you feel your voice was heard?

How easy was it to communicate your ideas in a mixed group of students and early career nurses? Was there anything the facilitators could have done to make this easier?

Was it helpful for early career nurses and students to meet separately for the first session?

Do you think the final intervention reflected the ideas of the co-production group?

Appendix 7: Phase 1 topic guide for co-production group facilitators

The interviews were semi-structured, consequently the questions were a guide, and the interviewer was able to choose to probe more deeply into areas of interest by using prompts and additional questions that are relevant to the conversation.

Questions included:

The Co-production process:

Please tell me about your experience of facilitating the co-production group.

Do you think co-production is an effective way of developing an intervention to encourage retention of early career nurses? Why?

What did you enjoy most about the co-production process?

Were there any challenges to facilitating the co-production process and if so, what were they?

Were any of the exercises more effective/enjoyable/relevant than any others? Which ones and why?

Would you use co-production again?

Power dynamics

To what extent did you feel that you were able to encourage all group members to speak up in the co-production sessions?

Did you feel all voices in the group were heard? What did you do to encourage this?

Personal development:

Did you develop any transferrable skills by facilitating the co-production process?

If yes, what were these?

In what context would you anticipate using these skills in the future?

How do you think your personal characteristics and experience impacted on the process? (or: what do you think would have been different if someone without your experience and skills had facilitated the process?)

Appendix 8: Phase 2 participant information sheet for students

This PIS was used to inform students about the wider Burdett Trust Funded study, of which this PhD study was a part.

School of Health Sciences **Opportunity to be involved in a research project aimed at nurse retention**

Title of study: Burdett Trust Early Career Nurse Retention and Burnout Study

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The project aims to design and implement a new intervention to support student nurses to transition to staff nursing posts and to encourage them to continue working at Barts Health for their first year as a registered nurse and beyond. The project is a partnership between City, University of London and Barts Health NHS Trust and is funded by the Burdett Trust for Nursing. The three year project involves Professor Debra Salmon (Dean) and academics from the School of Health Sciences at City, University of London. It focuses on empowering students and early career nurses to build personal resources and professional networks, and work effectively with these to develop a sense of connectedness to their employing organisation. In order to determine whether the intervention is effective, there will be a group that receives the intervention and a comparison group that does not. The first stage of the project is about exploring the professional networks of the comparison group of students, and tracking their career choices in the first year after qualification as a nurse. The second stage is about exploring the professional networks of a group of students who take part in the intervention and then tracking their career choices in a similar way.

Why have I been invited?

You have been invited to take part because you are an adult or children's nursing student at City, University of London, in your third year of the programme. As this is a collaborative project with Barts Health you have been identified as a student who has placements in that organisation. All students who are placed at Barts Health in the third year of the programme have been invited to take part in the comparison or the intervention group.

Do I have to take part?

No, you don't have to take part. Participation is voluntary, and even if you decide to become involved, you may withdraw at any stage, or avoid answering questions which you feel are too personal or intrusive. If you decide not to take part or to withdraw, this will not

affect your relationship with any staff members here at City, University of London or impact on your studies or grades in any way.

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

Once the data has been anonymised or published you will no longer be able to withdraw your data.

What will happen if I take part?

The research study lasts until August 2020 and you may be asked to provide data on up to four occasions during that time. This data collection will require you to complete some questionnaires about your mental health and wellbeing, resilience and your perceptions of your work as a nurse. You will also be asked to take part in a group exercise and to choose whether you would like to be interviewed on a one to one basis by a member of the research team.

This will involve:

	When?	What will I do?
Baseline measurements	Within the next four weeks	• Group exercise • Completing questionnaires
Time point 1	At end of the academic year	• Completing questionnaires • Option to take part in an interview
Time point 2	Within two months of qualification	• Completing questionnaires
Time point 3	Six months post-qualification	• Completing questionnaires • Group exercise • Option to take part in an interview

The meetings with the researcher will last no longer than one hour. The interviews and group exercises will focus on your experiences as a student nurse and early career nurse including your personal resources, professional networks and career choices. The data collection will either take place while you are at City, University of London for taught sessions or the researcher will meet you while you are in placement.

Expenses and Payments (if applicable)

As some of these meetings will fall during placement time, we have negotiated with your Programme Director that we can sign off meeting hours in your Practice Assessment Document (PAD) to recognise the contribution that this project will make to your learning. Travel costs will be reimbursed as appropriate.

What do I have to do?

If you are willing to take part in this study you will be asked to sign a consent form and then you will be invited to attend a session to fill in the questionnaires and complete the group exercise. If you volunteer to take part in an interview this will be arranged at a time and place that is convenient to you. This will happen on a maximum of four occasions.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks to taking part.

What are the possible benefits of taking part?

This is an opportunity to be part of a research project that feeds into the Barts Health Nursing, Midwifery and Allied Health Practitioner research strategy, led by Caroline Alexander, Chief Nurse. You would be participating in a project that will make a significant contribution to the ongoing development and practice experience of student nurses and newly qualified nurses as they settle in to their first year as a registered nursing.

What will happen when the research study stops?

Audio files of interviews will be destroyed as soon as the interviews have been transcribed. Once the research study has finished, any personal data (e.g. names, placement detail) will be deleted within 3 months and all other data will be archived for ten years as per City, University of London data retention policy, then destroyed. Your data will only be used in the ways that are outlined on the consent sheet and for no other purpose.

Will my taking part in the study be kept confidential?

If you consent to take part in the study you will be assigned a participant number that will be linked to all the data you provide, instead of your name. For the group exercise and the interviews, your permission will be sought to audio record any conversations that take place. Audio recorded data will be transcribed by a third party, usually an independent transcriber, and will at this point be anonymised by assigning a research number to your transcripts. If the transcriber does not work at City, University of London, there will be a confidentiality agreement in place with him or her. Only the research team will hear the recorded data and the transcripts. If quotes from your interviews are used in subsequent publications, the research team will ensure that you cannot be identified from the quotes.

Hard copies of transcripts will be stored in a locked filing cabinet at City, University of London. Electronic copies of transcripts will be stored on an encrypted computer that is password protected. All data (in an anonymised form) will be archived for 10 years at the end of the study and then destroyed as per City, University of London policy.

Your discussions will be kept confidential unless you disclose unsafe practice that may cause harm to a patient, yourself or colleague, at which point the researcher would be required to share your disclosure with the relevant practitioner at Barts Health NHS Trust.

What will happen to results of the research study?

The results of the research study will be presented to Barts Health Executive Team both orally and as a report. The report will be available for you to access from the City, University

of London website. It is anticipated that the findings will be published in an academic journal and may be presented at appropriate conferences.

What will happen if I do not want to carry on with the study?

You are free to withdraw from the study without an explanation or penalty at any time.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City, University of London's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Burdett Trust Early Career Nurse Retention and Burnout Study

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You could also write to the Secretary at:

Research Governance & Integrity Manager
Research & Enterprise
City, University of London
Northampton Square
London
EC1V 0HB
Email:

City, University of London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Who has reviewed the study?

This study has been approved by City, University of London School of Health Sciences Research Ethics Committee

Further information and contact details (Redacted)

Data Protection Privacy Notice: What are my rights under the data protection legislation?

City, University of London is the data controller for the personal data collected for this research project. Your personal data will be processed for the purposes outlined in this notice. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing

of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees.

What if I have concerns about how my personal data will be used after I have participated in the research?

In the first instance you should raise any concerns with the research team, but if you are dissatisfied with the response, you may contact the Information Compliance Team at dataprotection@city.ac.uk or phone 0207 040 4000, who will liaise with City's Data Protection Officer Dr William Jordan to answer your query.

If you are dissatisfied with City's response you may also complain to the Information Commissioner's Office at www.ico.org.uk

Thank you for taking the time to read this information sheet.



School of Health Sciences
The Burdett Trust Early Career Nurse Retention and Burnout Study:
invitation to take part in a focus group

Title of study: Burdett Trust Early Career Nurse Retention and Burnout Study

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The project aims to design and implement a new intervention to support student nurses to transition to staff nursing posts and to encourage them to continue working at Barts Health for their first year as a registered nurse and beyond. The project is a partnership between City, University of London and Barts Health NHS Trust and is funded by the Burdett Trust for Nursing. The three year project involves academics from the School of Health Sciences at City, University of London. It focuses on empowering students and early career nurses to build personal resources and professional networks, and work effectively with these to develop a sense of connectedness to their employing organisation. In order to determine whether the intervention is effective, there will be a group that receives the intervention and a comparison group that does not. The first stage of the project is about exploring the professional networks and wellbeing of the comparison group of students and tracking their career choices in the first year after qualification as a nurse. The second stage is about exploring the professional networks and wellbeing of a group of students who take part in the intervention and then tracking their career choices in a similar way. As well as evaluating the effectiveness of the intervention we want to assess feasibility, in order to make improvements before wider implementation.

General data protection regulations

City, University of London is the sponsor for this study based in England. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. City, University of London will keep identifiable information about you for 3 months after the study has finished, and all other non-identifiable data for 10 years.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you

withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

You can find out more about how we use your information by contacting XXXX, Research Governance & Integrity Manager.

City, University of London will use your name, and contact details to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Individuals from City, University of London and regulatory organisations may look at your research records to check the accuracy of the research study. The only people in City, University of London who will have access to information that identifies you will be people who need to contact you to arrange for you to take part in the study or audit the data collection process. The people who analyse the information will not be able to identify you and will not be able to find out your name or contact details.

City, University of London will keep identifiable information about you from this study for 3 months after the study has finished and all other data for 10 years.

Why have I been invited?

You have been invited to take part because you are a member of SHS staff who has either delivered some of the intervention taught content, facilitated a group activity as part of the intervention, or been responsible for supporting the administration of the intervention. We would like to find out your perspectives on the barriers and enablers to implementation.

Do I have to take part?

No, you don't have to take part. Participation is voluntary, and even if you decide to become involved, you may withdraw at any stage, or avoid answering questions which you feel are too personal or intrusive. If you decide not to take part or to withdraw, this will not affect your relationship with any staff members here at City, University of London.

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

Once the data has been anonymised or published you will no longer be able to withdraw your data.

What will happen if I take part?

You will be asked to participate in one focus group with a member of the research team. The focus group will last between 30 and 60 minutes, depending on what you have to say. It will be held at City, University of London.

What do I have to do?

If you are willing to take part in this study you will be asked to sign a consent form prior to the focus group. You will only need to attend the focus group once.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks to taking part.

What are the possible benefits of taking part?

This is an opportunity to be part of a research project that feeds into the Barts Health Nursing, Midwifery and Allied Health Practitioner research strategy, led by Caroline Alexander, Chief Nurse. You would be participating in a project that will make a significant contribution to the ongoing development and practice experience of student nurses and newly qualified nurses as they settle in to their first year as a registered nursing.

What will happen when the research study stops?

Audio files of the focus group will be destroyed as soon as the focus group has been transcribed. Once the research study has finished, any personal data (e.g. names, placement detail) will be deleted within 3 months and all other data will be archived for ten years as per City, University of London data retention policy, then destroyed. Your data will only be used in the ways that are outlined on the consent sheet and for no other purpose.

Will my taking part in the study be kept confidential?

If you consent to take part in the study you will be assigned a participant number that will be linked to all the data you provide, instead of your name. Your permission will be sought to audio record any conversations that take place. Audio recorded data will be transcribed by a third party, usually an independent transcriber, and will at this point be anonymised by assigning a research number to your transcripts. If the transcriber does not work at City, University of London, there will be a confidentiality agreement in place with him or her. Only the research team will hear the recorded data and the transcripts. If quotes from your contribution to the focus group are used in subsequent publications, the research team will ensure that you cannot be identified from the quotes.

Hard copies of transcripts will be stored in a locked filing cabinet at City, University of London. Electronic copies of transcripts will be stored on an encrypted computer that is password protected. All data (in an anonymised form) will be archived for 10 years at the end of the study and then destroyed as per City, University of London policy.

Your discussions will be kept confidential unless you disclose unsafe practice that may cause harm to a patient, yourself or colleague, at which point the researcher would be required to share your disclosure with the relevant practitioner at Barts Health NHS Trust.

What will happen to results of the research study?

The results of the research study will be presented to Barts Health Executive Team both orally and as a report. The report will be available for you to access from the City, University of London website. It is anticipated that the findings will be published in an academic journal and may be presented at appropriate conferences.

What will happen if I do not want to carry on with the study?

You are free to withdraw from the study without an explanation or penalty at any time.

What if there is a problem?

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through City, University of London's complaints procedure. To complain about the study, you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Burdett Trust Early Career Nurse Retention and Burnout Study

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You could also write to the Secretary at:

Research Governance & Integrity Manager
Research & Enterprise
City, University of London
Northampton Square
London
EC1V 0HB
Email:

City, University of London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone's negligence, then you may have grounds for legal action.

Who has reviewed the study?

This study has been approved by City, University of London School of Health Sciences Research Ethics Committee

Further information and contact details

Data Protection Privacy Notice: What are my rights under the data protection legislation?

City, University of London is the data controller for the personal data collected for this research project. Your personal data will be processed for the purposes outlined in this notice. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees.

What if I have concerns about how my personal data will be used after I have participated in the research?

In the first instance you should raise any concerns with the research team, but if you are dissatisfied with the response, you may contact the Information Compliance Team at dataprotection@city.ac.uk or phone 0207 040 4000, who will liaise with City's Data Protection Officer to answer your query.

If you are dissatisfied with City's response you may also complain to the Information Commissioner's Office at www.ico.org.uk

Thank you for taking the time to read this information sheet.

Appendix 10: Phase 2 consent form for staff and student interviews



Title of study:

Burdett Trust Early Career Nurse Retention and Burnout Study

Please initial box

1.	I confirm that I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records. I understand this will involve: • Participating in an interview by the researcher on one occasion • allowing the interview to be audiotaped	
2.	This information will be held and processed for the following purpose(s): • to help us understand your experience and views of the implementation of the intervention with nursing students for the Burdett Trust Nurse Retention and Burnout Study • to include in findings that will be presented to the Executive of Barts Health NHS Trust • to include in findings that may be presented at conferences and/or published in academic journals. The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees.	

	I understand that any information I provide is confidential, unless I disclose unsafe practice that may result in harm to me, my patients or my colleagues. No information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published. The identifiable data will not be shared with any other organisation.	
3.	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.	
4.	I agree to City, University of London recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on City, University of London complying with its duties and obligations under the General Data Protection Regulation (GDPR).	
	I understand that relevant sections of data collected during the study, may be looked at by individuals from City, University of London, from regulatory authorities, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my anonymised data.	
5.	I agree to the use of anonymised quotes in publication.	
6.	I agree to take part in the above study.	

Name of Participant

Signature

Date

Name of Researcher

Signature

Date

When completed, 1 copy for participant: 1 copy for researcher file.

Appendix 11: Phase 2 acceptability questionnaire

The acceptability questionnaires were administered at the beginning and end of the intervention and the questions were altered to reflect the temporal nature of the questionnaire. The example below is the questionnaire completed at the beginning of the process.

Burdett Trust Nurse Retention and Burnout Study Acceptability Questions for Students

These questions relate to the four extra days of taught content and group activities that you will be asked to attend as part of a partnership research project with Barts Health NHS Trust. Barts Health NHS Trust are interested in supporting nurse retention and the intention of the four extra days is to help you develop additional skills to support you during your early career as a nurse.

Please circle the answer that best suits your opinion.

1. How acceptable do you feel it is to participate in these extra group and taught sessions?

completely unacceptable	unacceptable	No opinion	Acceptable	Completely acceptable
1	2	3	4	5

2. I think I will enjoy taking part in the extra taught and group sessions.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

3. How much effort will it take for you to participate in the extra taught and group sessions?

Huge effort	A lot of effort	No opinion	A little effort	No effort at all
1	2	3	4	5

4. The extra sessions will be effective in helping me during my early career as a qualified nurse.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

5. I will value extra sessions as a way of helping me get ready for my early career as a qualified nurse in Barts Health NHS Trust.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

6. Participating in these extra sessions will interfere with my other priorities.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree
1	2	3	4	5

7. How confident do you feel about participating in the extra taught and group sessions?

Very unconfident	Unconfident	No opinion	Confident	Very Confident
1	2	3	4	5

8. It is clear to me how participating in the extra taught and group sessions will help me to cope better with the transition from student to qualified nurse.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

9. Do you have any other comments you would like to make at this stage? Please write in the box below.

Appendix 12: Phase 2 guide for staff focus groups

The interviews were semi-structured, so the questions were a guide, and the interviewer was able to choose to probe more deeply into areas of interest by using prompts and additional questions that are relevant to the conversation. To a large extent the questions were constructed following analysis of the quantitative survey data about acceptability of the intervention and attendance data. The question guide was designed to explore and provide context to issues identified in the survey data.

Topics covered included:

- General discussion on experience of supporting the intervention
- Logistical challenges (timetabling of sessions, room booking, contacting student etc)
- Impression of the relevance of the content of the session (provide sheet with the content detail)
- Impression of the appropriateness of the timing of the intervention within the programme
- Reasons why attendance at sessions was good/poor
- Ideas for how the implementation could be improved for further iterations of the intervention
- Impact on other areas of the programme curriculum
- Unintended consequences of implementing the intervention

Appendix 13: Phase 2 guide for student interviews

The interviews were semi-structured, so the questions were a guide, and the interviewer was able to choose to probe more deeply into areas of interest by using prompts and additional questions that were relevant to the conversation.

Questions included:

Am I right in thinking you took part in the additional study days in January/March/May?
How many were you able to attend?

Can you tell me a bit about your experience of attending the days? What was good/bad about them? (follow up on any interesting points). What were your favourite parts/parts you least enjoyed?

How relevant did you think the content of the days (ACT, time management, developing social networks, assertiveness and difficult conversations, coping with stress) was to you and your role as a nurse?

You say you were able to attend X number of the four days. What were some of the challenges with attendance? OR, if all 4 attended, how did you manage to prioritise attendance at all the sessions?

Would you have liked to have attended all 4 sessions?

How appropriate was the timing of the intervention within the programme? (if not already addressed)

What do you think we could have done differently to make the sessions more effective?

- Prompts
 - Should we change any of the content?
 - Should it be available to all the student nurses not just Barts nurses?
 - When would it be best placed in the curriculum? Should it be part of practice (facilitated by link lecturers) or theory and facilitated at City or as part of simprac?

Are there any skills or ideas that you are now using that you learned during the four extra days? Which are they and can you give an example of how you have used them?

Is there anything else you would like to say about the four days?

Thank you very much for taking part.