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A Systematic Review of Training Interventions for Emergency Department Providers and Psychosocial Interventions delivered by Emergency Department Providers for Patients who self-harm

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ABSTRACT

Objectives: People who self-harm frequently present to the emergency department (ED) and are treated by generalist healthcare staff with no specialist mental health training. We systematically reviewed (i) training interventions for generalist ED providers and (ii) psychosocial interventions delivered predominantly by generalist ED providers for people who self-harm.

Method: Five databases were searched for studies reporting on training interventions for generalist ED staff (at least 50% of the sample needed to be generalist ED staff) or psychosocial interventions for people who self-harm delivered predominantly by generalist ED staff. No limitations were placed regarding study design/country. Narrative synthesis was conducted.

Results: Fifteen studies from high-income countries were included. Nine studies of moderate methodological quality evaluated training for generalist ED providers ($n = 1587$). Six studies of good methodological quality evaluated psychosocial interventions for adults who self-harm ($n = 3133$). Only one randomized controlled trial was identified. Training was linked with pre-post improvements in staff knowledge, and less consistently with improvement in skills, attitudes, and confidence. Evidence on patient outcomes was lacking. Patient-level interventions involving common suicide prevention strategies—safety planning and follow-up contact—were consistently linked to pre-post reductions in suicide attempts. Effects on treatment engagement and psychiatric admissions were unclear.

Conclusions: There is a clear need for further RCTs to improve the evidence base for ED generalist providers managing patients with self-harm. Evidence supports potential benefits of training for improving staff knowledge, attitudes, and skills, and of safety planning and follow-up contact for reducing repeat suicide attempts.

KEYWORDS

Suicide; self-harm; emergency department; psychosocial interventions; staff education

HIGHLIGHTS

- More RCTs are needed to improve the evidence base for ED providers managing self-harm
- Safety planning and follow up contacts are linked to reductions in repeat suicide attempts
- Future research should investigate the impact of staff training on patient outcomes

Supplemental data for this article can be accessed at publisher's website

INTRODUCTION

Suicide is a leading cause of death worldwide. Over 800,000 people die by suicide every year, equivalent to one person every 40 s (World Health Organisation, 2017). There is a strong relationship between suicide and self-harm—i.e., deliberate self-poisoning or self-injury, irrespective of the apparent purpose of the act (Franklin et al., 2017; Hawton, Taylor, Saunders, & Mahadevan, 2011, Hawton et al., 2015; National Institute of Health and Care and Excellence, 2004). Many people who self-harm commonly seek support in the emergency department (ED), which is often their primary option for urgent contact within the healthcare system (Larkin & Beautrais, 2010). Internationally, EDs manage high numbers of self-harm presentations. Every year, there are over 500,000 hospital attendances for self-harm in the US (Canner, Giuliano, Selvarajah, Hammond, & Schneider, 2018), and around 220,000 attendances in England: the highest incidence rates in Europe (Clements et al., 2016; Cooper et al., 2013, 2015), and these rates are increasing.

Research found that roughly 60% of suicide decedents had visited the ED within the year prior to their death (Ahmedani et al., 2014). Along with facing increased risk for suicide death, adults discharged from the ED for suicidal behavior are at elevated risk for recurrence of suicidal thoughts and behaviors during the 6 months following discharge (Larkin & Beautrais, 2010). It is predicted that one in 25 patients presenting to EDs with self-harm will die by suicide within 5 years, demonstrating the importance of this area in healthcare to save lives (Carroll, Metcalfe, & Gunnell, 2014). However, engaging patients in timely and accessible treatment is challenging, as up to half of patients discharged from the ED drop out or do not engage in outpatient treatment (Knesper, 2011; Stanley & Brown, 2012). As such, the ED can be the only contact with the healthcare system for people who self-harm, representing a vital opportunity for intervention and suicide prevention (Betz et al., 2016; Larkin & Beautrais, 2010). Interventions can focus primarily on providers (i.e., staff training and education) or patients (i.e., specific treatments). However, the evidence regarding effectiveness of existing interventions is limited (Ceniti, Heinecke, & McInerney, 2020; NICE, 2018).

Clinical guidance in the UK states that every patient who presents to the ED with self-harm should be assessed by a mental health specialist (National Institute of Health and Care Excellence, 2004); however, research indicated that this guidance is followed in only around 60% of cases (Carroll et al., 2014; Cooper et al., 2013; Kapur et al., 2013). These findings indicate that many people who self-harm, receive treatment from staff who are not mental health specialists (from here on, generalist ED providers). Worldwide, only about 3% of training for general physicians and nurses focuses on mental health (Rothes, Henriques, Leal, & Lemos, 2014). Generalist ED providers' ability to treat patients at risk of suicide is thus limited as they are not sufficiently equipped to deliver effective interventions (Brunero, Jeon, & Foster, 2012; Rothes et al., 2014).

This study aims to systematically review (1) training interventions for generalist ED providers and (2) psychosocial interventions delivered by ED generalists for patients presenting with self-harm, and the impact of these interventions on staff and patient outcomes.

METHODS

This is a systematic review based on the PRISMA guidelines (Page et al., 2021). The review was registered in PROSPERO as CRD42020177144.

Search strategy and eligibility criteria

Searches were conducted in PubMed, MEDLINE, PsycINFO, CINAHL and the Cochrane Central Register for Controlled Trials (CENTRAL), from inception to May 2020 with reference list, forward and backwards citation searching of included literature. An additional search was conducted in November 2021 (no additional studies were identified). A broad search strategy was applied consistently in each database. Search terms were combined using Boolean operators "AND" and "OR". The strategy was refined with literature search experts and by a prior scoping literature review.

The inclusion criteria were (a) generalist ED providers and/or patients presenting with self-harm, (b) training for generalist ED staff in relation to self-harm (at least 50% of the sample needed to be generalist ED staff) and/or psychosocial intervention for patients presenting with self-harm, where the majority of the intervention was delivered by generalist ED staff. The exclusion criteria were (a) interventions involving pharmaceutical treatment, (b) opinion pieces and gray literature, (c) studies in other languages besides English. No restrictions were placed on participants' age and sex, study design, location, and date of publication.

Study selection

EndNote X7.0.2 was used to store and manage articles. Following duplicate removal, titles and abstracts were screened against eligibility criteria and included studies submitted to full text screening. Title and abstract screening were completed by AZ and full text screening assisted by ML and RM. Discrepancies were resolved through discussion.

Data extraction

Data were extracted using an extraction form developed by the authors. Information was collected regarding study characteristics (e.g., publication date, country, aims) and PICOS components (i.e., population, intervention, comparison, outcomes, and study design). AZ extracted data with 50% checked by an independent reviewer (TD). Discrepancies were resolved through discussion.

Quality appraisal

Two independent reviewers (AZ and TD) assessed the quality of all included studies. Differences were resolved through discussion. The Mixed Methods Appraisal Tool (MMAT) (Pluye et al., 2011) was used to assess methodological quality.

Synthesis of results

A meta-analysis could not be conducted due to the diversity of interventions and outcome measures and the methodological quality of studies. A narrative synthesis of findings was conducted, including descriptions of studies and interventions.

RESULTS

Search results

Study selection combining the initial with the updated search is summarized in Figure 1. The search yielded 13,771 citations after duplicates. No records were identified through backward citation screening. After initial screening of titles and abstracts, 125 full texts were reviewed for eligibility. Of those, 16 were included. This involved 15 unique studies,

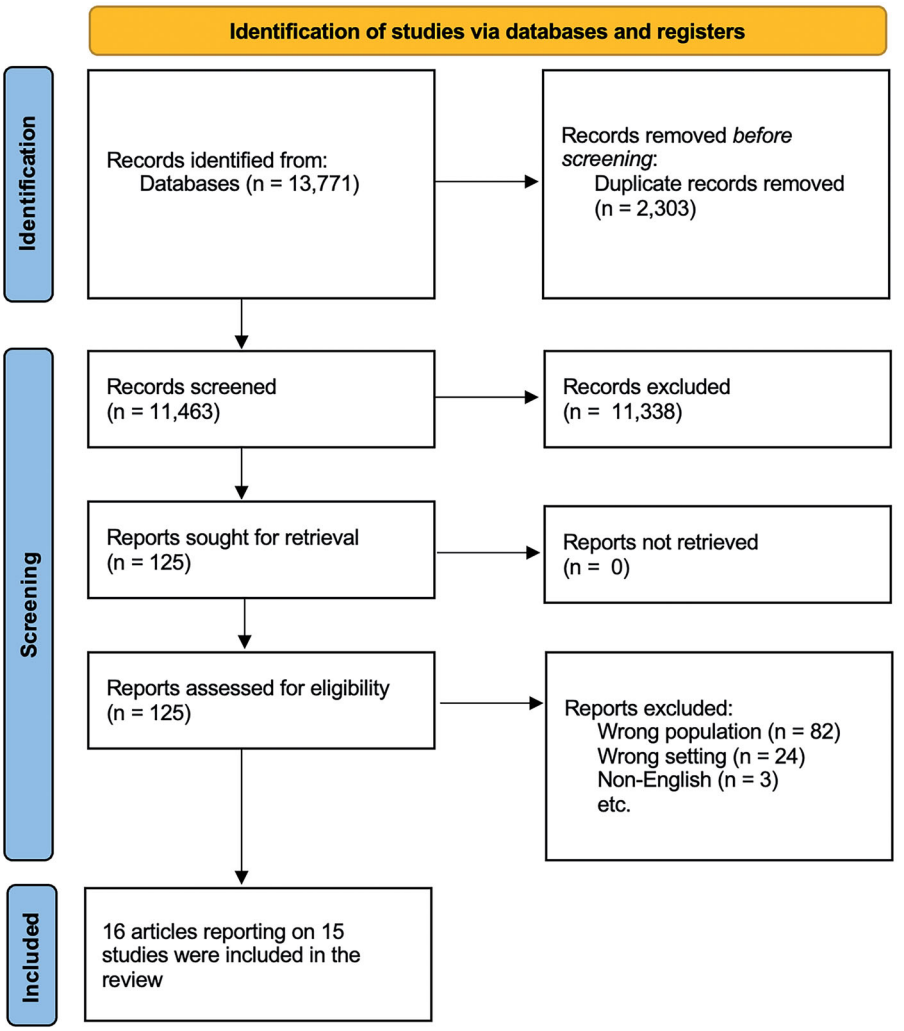

FIGURE 1. PRISMA flow diagram.

as some authors reported subsets of data in multiple articles (McAllister, Billett, Moyle, & Zimmer-Gembeck, 2009; McAllister, Moyle, Billett, & Zimmer-Gembeck, 2009).

Study characteristics

Study characteristics are presented in Table 1. Included studies were published between 1997 and 2018. All were conducted in high-income countries, namely USA ($n = 9$), UK ($n = 3$), Australia ($n = 1$), Japan ($n = 1$) and Belgium ($n = 1$). Most studies used quasi-experimental before/after designs ($n = 11$), one study used a qualitative design (Stanley et al., 2016) and one study was mixed methods, reporting qualitative (McAllister, Moyle, et al., 2009) and quantitative (McAllister, Billett, et al., 2009) results separately. Only one randomized controlled trial (RCT) was identified (van Landschoot, Portzky, & van Heeringen, 2017). Together, the studies implemented 12 interventions, details of which are presented in Tables 2 and 3. Nine were staff training interventions for ED nurses and physicians ($n = 1587$). Three were patient-level interventions for adults presenting with self-harm ($n = 3133$).

Quality appraisal/methodological quality of studies

MMAT quality scores are displayed in Table 1. The average methodological quality of staff training studies was moderate (50%), indicating a lack of methodological rigor. Only one RCT was included (van Landschoot et al., 2017). Methodological limitations included lack of a control, lack of validated and reliable measures, and low response and/or completion rates. Most studies relied on self-reported changes in skills and knowledge assessed immediately post-intervention/short-term follow-up, with no evaluation of effects on care or patient experience. This limits the possibility to draw conclusions as to whether effects were maintained long-term.

The methodological quality of studies evaluating patient-level interventions was better, with an average score of 75%. This indicates good methodological quality within the limits of their study designs, however, no RCTs were identified. The cohort comparison study (Stanley et al., 2018) was excellent quality (100%). Four studies were good quality, scoring 75% (Knox et al., 2012) (Miller et al., 2017; Stanley et al., 2015, 2016). One study (Alonzo, 2016) was poor quality (25%) due to a small sample ($n = 22$) and no control group.

Intervention characteristics and effectiveness

Staff training interventions

Nine studies reported on interventions aimed to improve generalist ED providers' knowledge, skills in assessing and managing self-harm, professional confidence, and attitudes. Characteristics of these interventions are presented in Table 2. They were heterogeneous in form and intensity. They ranged from a very brief 1-h teaching session (Crawford, Turnbull, & Wessely, 1998) to five half-day workshops over 7 weeks (Holdsworth, Belshaw, & Murray, 2001). The interventions ranged from an educational poster (van Landschoot et al., 2017) to training in a specific model of care called

TABLE 1. Summary characteristics of included studies.

	Design	Country	Participants	Intervention	Control	Measures	Outcomes	Follow up	Findings	MMAT score
(a) Staff training studies										
van Landschoot 2017	Cluster randomized controlled trial (RCT)	Belgium	1171 staff from ED and psychiatric department (54.5% ED)	Poster with information about suicide and clinical triage guide	No intervention	Pre/post: Subscales of: (a) Question, Persuade and Refer questionnaire (QPR); (b) Suicide Information Test (SIT); (c) Confidence and Beliefs Questions (CBQ); (d) Adjusted version of Attitudes Toward Suicide Questionnaire (ATTS)	Knowledge regarding suicidality, confidence in assessing and treating suicidal individuals, attitudes toward suicidal patients	/	No significant effects on knowledge; No significant effect on confidence; Significant effect on attitudes; but only among MH staff ($M = 12.0$ vs. $M = 12.6$; $p = 0.02$).	Excellent
McAllister, Moyle, et al., 2009	Qualitative	Australia	36 emergency nurses	Solution-focused nursing (SFN)	/	Interviews post intervention	Knowledge/ understanding of self-harm; skills in assessing self-harm patients; attitudes; confidence	2 weeks	Improvements in confidence, assessment skills, and attitudes, increased knowledge and understanding of self-harm	Good
McAllister, Billett, et al., 2009	pre/post	Australia	28 emergency nurses	Solution-focused nursing (SFN)	/	"think-aloud procedure" (vignettes evaluation) to test clinical reasoning and understanding self-harmre-test, post-test	Knowledge and skills in assessing self-harm patients	2 weeks	Significantly increased knowledge and skills in assessing self-harm patients (13.3 pretest, 15.4 post-test (out of possible 30); paired $t(27) = -2.62$, $p < 0.05$.)	Moderate
Crawford et al., 1998	pre/post	UK	45 nurses, 15 junior medical staff	1-hour lecture plus discussion	/	Pretest/post-test Medical notes, knowledge, and attitudes questionnaire	Quality of psychosocial assessment, Knowledge, Attitudes, number of patients who requested follow up treatment	Within 11 weeks	Significantly improved psychosocial assessment (from 13% to 46%; $X2 = 14$, $p = 0.01$), notes more likely to be judged adequate if pro forma (SAD PERSON SCALE) was used (52 of 66 vs. 6 of 61; $x2 = 60$, $p = 0.01$). No significant improvements in knowledge and attitudes. No significant increase in the number of patients who requested follow up treatment—five (3%) vs 10 (5%) ($X2 = 1.1$, $p = 0.3$).	Moderate

Horwitz et al., 2011	post-test only	USA	32 ED resident physicians, 48% females	Web-based training programme, 6 × 30 min	/	post-test questionnaire to assess knowledge; retrospective self-evaluation of pretest knowledge, questions assessing satisfaction with the training	Knowledge in assessing and managing young suicidal patients; satisfaction with the training	/	Significantly higher knowledge scores on the post-test compared with the self-rated pretest (6.4 +- 1.1 vs 3.8 +- 2.3; P G 0.001), an effect size of 1.32. High satisfaction with the training (4.2/5)	Moderate
Kishi et al., 2014	pre/post	Japan	52 ED nurses	1 day 7-h workshop focused on suicidality	/	The Understanding Suicidal Patients (USP) Scale, additional questions about training and treatment for suicidal patients, pre/post	Understanding suicidal patients, attitudes/willingness to care, knowledge of treatment	1 month	Significant improvements in understanding and attitudes/willingness to care for suicidal patients, no improvements in knowledge (significant improvements only on 2 out of 6 questions)	Moderate
Shim & Compton, 2010	pre/post	USA	54 ED staff (50% nurses, 50% others)	2-h lecture and 1-hour discussion about suicide and self-harm	/	Pretest: questionnaires of knowledge and self-efficacy, Post-test: same, plus questions about satisfaction with the programme	knowledge and self-efficacy regarding management of suicidal patients, satisfaction with the programme	/	Significant increase in knowledge scores (from 7.9 ± 1.9 to 13.6 ± 2.1, p\.001) and self-efficacy scores (from 24.0 ± 9.1 to 32.3 ± 9.2, p\.001), high satisfaction with the programme	Moderate
Giordano & Stichler, 2009	pre/post	USA	118 ED nurses	Educational intervention on suicidality	/	Pretest/post-test survey of knowledge	Knowledge of suicide risk factors and appropriate interventions to mitigate suicide risk	/	Significant increase in knowledge after the intervention (From $M = 45.29$, $SD = 3.11$ to $M = 39.73$, $SD = 4.16$) ($t = -13.62$, $p < .05$)	Poor
Turnbull & Chalder, 1997	pre/post	UK	37 ED nurses, 14 doctors	1-hour lectures over 4 weeks	/	Pre/post-test Questionnaire of negative attitudes, Number of patients who requested specialist follow-up	Knowledge of epidemiology and risk factors for suicide and self-harm, attitudes regarding DHS and suicide, patient outcomes (requests for follow-up treatment)	6 weeks	Significant improvement in knowledge ($t = -2.32$, d.f.=20. $p < 0.03$), No significant differences in attitudes at 6 weeks follow-up Significant increase in specialist follow-up requested by patients at 5 month s follow-up (8 v 18; $x2 = 5.19$, $p < 0.02$).	Poor
Holdsworth et al., 2001	pre/post	UK	13 nurses working in ED (medical admission and minor injury units)	5 half-day workshops over 7 weeks	/	Post-intervention, self-reported improvements in knowledge and skills; and a pre/post questionnaire of stress, coping responses, and feelings of irritation, anxiety and hopelessness	Work related stress; confidence, knowledge and skills in assessing and managing suicidal and self-harm patients	/	Decrease in anxiety, irritation, and helplessness; Increase in confidence; Self-reports of increase in knowledge and skills No details reported, no tests of significance due to small sample	Poor

(*continued*)

TABLE 1. Continued.

	Design	Country	Participants	Intervention	Control	Measures	Outcomes	Follow up	Findings	MMAT score
(b) Patient level intervention studies										
Stanley et al., 2018	Cohort comparison design	USA	1640 suicidal patients, 88% male, Mean age 48 years	Safety Planning Intervention with structured follow-up (SPI+)	TAU	Medical records	Suicidal behavior, treatment engagement	6 months	Intervention group less likely to engage in suicidal behavior (3.03%) than control (5.29%), Significantly less (45% decrease) suicidal behaviors over the 6 months (odds ratio, 0.56; 95%CI, 0.33–0.95, $p = .03$); Intervention group had more than double the odds of attending at least 1 outpatient mental health visit (odds ratio, 2.06; 95%CI, 1.57–2.71; $p < .001$).	Excellent
Miller et al., 2017	Interrupted time series design	USA	1376 adults with suicide attempt or ideation, 55.9% female, median age 37 years	Emergency department safety assessment and follow-up evaluation (ED-SAFE)	TAU and contacts for 1 year	Columbia suicide severity rating scale + medical records	Suicide attempts, Suicide composite (=occurrence of suicide, suicide attempt, interrupted/ aborted attempts & suicide preparatory acts)	1 year	Fewer suicide attempts (18.3% INT; 22.9% TAU; RR 0.80 (0.63 to 1.02))—i.e., relative reduction of suicide attempt risk of 20%; Lower suicide composite (41.4% INT; 48.9% TAU; RR 0.85 (0.74 to 0.97))	Good
Stanley et al., 2016	Qualitative	USA	100 suicidal veterans, 89% male, mean age 44.9 years	Safety Planning Intervention with structured follow-up (SPI-SFU)	/	semi-structured interviews, rating scale items to quantify responses	Perceived acceptability usefulness and helpfulness of SPI and SFU to patients	/	SPI: 97% reported satisfaction; 99% reported at least one helpful component, SFU: 96% reported satisfaction Combined: Most participants found the SAFE VET useful in mitigating suicide risk and in increasing the likelihood of treatment engagement, 99% found the SAFE VET intervention very acceptable	Good
Stanley et al., 2015	Pre/post	USA	95 suicidal veterans, 86% male, 75% aged 35 years or older	Safety Planning Intervention with structured follow-up (SPI-SFU)	/	Medical records	Treatment engagement, and ED visits and inpatient utilization/ suicide-related hospitalization	3 months	Significant increase in rates of outpatient mental health treatment attendance (from 63.5% to 77.1%; *p*-.02), Trend toward lower suicide-related hospitalizations, but insignificant	Good

Knox et al., 2012	Pre/post	USA	438 suicidal veterans	Safety Planning Intervention with structured follow-up (SPI-SFU)	/	Quality assurance data. Acceptability determined by willingness to receive the intervention; effectiveness on treatment engagement determined by MH treatment utilization	Acceptability, treatment engagement	6 months	Acceptability was high (93% agreed to receive the intervention) Significant increase in treatment engagement in 6 months after intervention (Mean= 9.2 vs 4.9; $p <$ .001); at least 80% patients received at least one outpatient treatment at 6 months	Good
Alonzo, 2016	Pre/post	USA	22 suicide attempters, 50% male, mean age 33.45 years	Problem-solving and comprehensive contact intervention (PS-CCI)	/	Questionnaires regarding the intervention at follow-up	treatment acceptability, suicidal behavior, hospitalization due to suicidal behavior, treatment engagement	3 months	High acceptability: No participants negative reaction to the intervention, and patients found all aspects of the intervention helpful. No reported (0) hospitalizations for suicidal behavior or reported engaging in any suicidal behavior at the 3-month follow-up. High level of engagement with follow-up treatment (73% patients were attending treatment at follow up)	Poor

TABLE 2. Characteristics of staff training interventions.

	Intervention	Education topics covered	Focus	Delivered by
McAllister, Billett, et al., 2009a; McAllister, Moyle, et al., 2009	2 h interactive lecture discussion, 1 h training in SNF	Ice-breaking activities and discussion to understand participants' attitudes, learning issues and current practice demands in relation to self-injury, theories for understanding self-injury as well as evidence-based treatments. Training in SFN and how it could be applied to self-injury	Self-harm	The first author (McAllister)—expert in education and SFN
Holdsworth et al., 2001	5 half-day workshops over 7 weeks	Suicide risk, responding to deliberate self-harm, risk assessment instruments, formal documentation, participants responses to suicide, helpfulness and hopelessness	Both self-harm and suicide	MH nurse
Turnbull & Chalder, 1997	One-hour group teaching sessions over a four-week period	Nature of suicide and deliberate self-harm, information on specialist follow-up services; doctors also taught how to complete mental health examination	Both suicidality and self-harm	Liaison nurse and psychiatrist
Kishi et al., 2014	1-day training workshop (7 h)	Suicide risk assessment, immediate management of the crisis, appropriate referral of patients, and changing attitudes to suicide prevention	suicide	Not reported
Shim & Compton, 2010	2 h of didactic lectures, 1 h of participant discussion	Terminology; statistical information about suicide; risk and protective factors; management of a suicide attempt in the ED; suicide assessment, creating a positive therapeutic alliance in the ED; management of high risk patients; indications for admission versus discharge; lethal means restriction	Both self-harm and suicide	Not reported
Horwitz et al., 2011	Semi structured web-based training programme, 6 modules, each lasting 30 min	Suicide risk factors, diagnoses associated with suicide, psychiatric interview and assessment skills, conducting mental health examination, care pathways, applying knowledge and skills in practice	suicide	NA (online)
Crawford et al., 1998	1h teaching session + time for discussion	Epidemiology of deliberate self-harm, assessment of risk, difficulties in assessment and how to manage them, aspects of management and how to make a referral to the parasuicide team	Both self-harm and suicide	MH nurses and psychiatrists
van Landschoot 2017	A poster and clinical triage guide were displayed for 4 weeks in strategic staff-only sites	Identifying and responding to high-risk patients, signs of suicide risk, facts and figures about suicide, suicide risk and history assessment, referral for suicide prevention services, checklist for discharge and documentation	Suicide	NA
Giordano & Stichler, 2009	Not reported	Identification of suicide risk factors using the modified SAD PERSONS Scale, the optimal immediate interventions, and long-term dispensation of the patient to mitigate the risk	Suicide	Not reported

"Solution focused nursing" (SFN) (McAllister, Billett, et al., 2009; McAllister, Moyle, et al., 2009).

Knowledge/understanding of suicidality and self-harm. All nine studies assessed understanding of self-harm, and six reported improvements. The only RCT (van Landschoot et al., 2017) found no effects of a poster intervention on knowledge. However, a solution-focused nursing training (good quality -(McAllister, Billett, et al., 2009; McAllister, Moyle, et al., 2009) led to significant improvements in nurses' understanding of self-harm as assessed by their responses to scenarios involving self-harm. Poorer quality studies revealed similar findings: training interventions seemed to improve participants' knowledge on key concepts relating to self-harm, including risk factors, epidemiology, assessment, management, and interventions (Giordano & Stichler, 2009; Holdsworth et al., 2001; Horwitz et al., 2011; Shim & Compton, 2010; Turnbull & Chalder, 1997). Most studies assessed knowledge using self-report and/or non-validated brief questionnaires.

Skills in assessment and management of patients. Three studies evaluated and found improvements in participants' skills in assessing, managing, and responding to suicidal and self-harm patients. Solution focused training significantly improved nurses' skills in assessing and responding to self-harm based on the "think-aloud" procedure (McAllister, Billett, et al., 2009) and qualitative interviews (McAllister, Moyle, et al., 2009).

Similar effects were found in poorer quality studies: training interventions seemed to improve participants' skills relating to self-harm, including management skills, and conducting psychosocial assessment (Crawford et al., 1998; Holdsworth et al., 2001). Again, skills were evaluated by self-report, rather than direct observation of skills. The only RCT (van Landschoot et al., 2017) did not assess skills.

Attitudes toward suicide and self-harm. Five studies assessed providers' attitudes toward self-harm: two significantly improved attitudes. Qualitative interviews with nurses following the solution focused training in McAllister, Billett, et al. (2009) showed positive attitudinal shifts toward patients who self-harm.

Kishi et al. (2014) found participants displayed significantly fewer negative attitudes and increased willingness to care for suicidal patients after a seven-hour workshop. The only RCT, of a poster intervention, found no improvements in attitudes (van Landschoot et al., 2017).

Confidence. Three of four studies that assessed confidence in treating self-harm reported improvements. Solution focused training (McAllister, Moyle, et al., 2009) increased nurses' confidence in treating and communicating with patients who self-harm. Two poorer quality studies found participants were more confident following a 2-h lecture with 1-h discussion, and five half-day-long lectures, respectively (Holdsworth et al., 2001; Shim & Compton, 2010). A poster van Landschoot et al. (2017), found no significant effect on confidence.

Professional well-being. There was insufficient evidence relating to participant well-being, as only one very small ($N = 13$) poor quality study assessed this (Holdsworth et al., 2001).

Participants self-reported a decrease in work-related stress, irritation and helplessness, following five half-day-long lectures about self-harm.

Patient outcomes. There was insufficient and inconsistent evidence relating to patient outcomes. Only two studies assessed the trainings' impact on patient outcomes, specifically the number of patients who wanted post-discharge follow-up before—compared to—after training. The intervention was effective in increasing the number of requests for care in Turnbull and Chalder (1997), but not in Crawford et al. (1998). No other patient outcomes were assessed.

Patient level interventions

Three interventions were implemented in six studies: (1) Problem-Solving and Comprehensive Contact Intervention (Alonzo, 2016); (2) Emergency Department Safety Assessment and Follow-up Evaluation (Miller et al., 2017); and (3) Safety Planning Intervention with structured follow-up (Knox et al., 2012; Stanley et al., 2015, 2016, 2018). A common component across all was follow-up contact, ranging from 3 to 12 months and involving telephone contacts, postcards, or both. Other strategies included motivating patients to engage in outpatient mental health treatment, identifying coping skills, and developing a safety plan. Details of the intervention characteristics are in Table 3.

Acceptability

Acceptability was assessed for only two interventions. Alonzo (2016) found the Problem-Solving and Comprehensive Contact Intervention acceptable to patients, most of whom rated all aspects of the intervention as helpful. The Safety Planning Intervention with Structured Follow-up was highly acceptable to patients: 93% agreed to receive it (Knox et al., 2012) and 99% found it very acceptable (Stanley et al., 2016).

Suicide attempts

All three interventions were linked to reductions in suicide re-attempts. Three uncontrolled studies found significant pre-post reductions in suicide re-attempts. Specifically, the Safety Planning Intervention with Structured Follow-up almost halved the odds of suicide attempts over 6 months (Stanley et al., 2018). The ED safety assessment and follow-up intervention was linked to significantly reduced suicide attempts at 1-year follow-up and led to a significantly lower suicide composite score (i.e., suicide, suicide attempt, interrupted/aborted attempts, and suicide preparatory acts; Miller et al., 2017). No participants engaged in suicidal behavior or experienced suicidal ideation at three months after the Problem-Solving and Comprehensive Contact intervention (Alonzo, 2016).

Treatment engagement

There was limited evidence in three uncontrolled studies for positive effects on engagement with outpatient care. Firstly, the Safety Planning intervention with Structured Follow-up significantly increased outpatient mental health attendance among suicidal

TABLE 3. Characteristics of patient level interventions.

	Intervention	Components	Implementation	Issue treated	Delivered by
Alonzo, 2016	Problem-solving and comprehensive contact intervention (PS-CCI)	1. Problem solving interview involving: (a) addressing anticipated barriers to treatment; (b) decisional balance worksheets to identify the pros and cons of: (1) attending follow-up treatment; and (2) engaging in suicidal behavior; (c) correcting misconceptions about outpatient treatment; and (d) support and encouragement to participate in follow-up care 2. follow-up contact reminding patients of their scheduled outpatient appointment	Problem-solving interview conducted upon admission to the ED; Follow-up contact consists of a postcard sent after discharge prior to the first scheduled outpatient appointment, and three telephone calls for three months after discharge.	Suicide attempt	ED clinicians
Knox et al., 2012; Stanley et al., 2015; Stanley et al., 2016; Stanley et al., 2018	SAFE-VET: First called Safety Planning Intervention (SPI) with structured follow-up (SFU) = SPI-SFI, and later renamed as SPI+ ("+" standing for structured follow-up/SFU)	2-stage behavioral intervention that Includes: (1) development of a safety plan (SPI) to identify personal warning signs of a developing suicide crisis, strategies to cope with subsequent suicidal feelings through identification of coping skills, professional and personal supports to seek during a suicidal crisis, and ways to reduce access to lethal means (2) brief structured telephone follow-up calls (SFU) after ED discharge, consisting of risk assessment, review and revision of the safety plan, and support of treatment engagement	SPI conducted in the ED SFU consists of at least two calls—first call within 1 week after ED visit with SPI, and additional calls continued on weekly basis until the first outpatient treatment appointment	Suicide attempt	ED clinicians
Miller et al., 2017	Emergency department safety assessment and follow-up evaluation (ED-SAFE)	1. Secondary suicide risk screening by ED physician following an initial positive screen; 2. self-administered safety plan and information to patients by nursing staff; 3. follow-up telephone calls focused on case management, facilitating treatment engagement/individual psychotherapy, and significant other involvement	Suicide risk screening delivered in the ED, safety planning and information provision in the ED, up to 7 brief (10–20 min) follow-up telephone calls to the patient and up to 4 calls to a significant other, at 6, 12, 24, 36, and 52 weeks	Suicide attempt	ED nurses and physicians; Follow-up calls conducted by 10 advisors: 6 PhD psychologists, 3 psychology fellows, and 1 masters-level counselor

veterans at 3 and 6 months after, compared to before the intervention (Knox et al., 2012; Stanley et al., 2015), and almost doubled the odds of attending at least one appointment at 6 months (2018). Secondly, the poorer quality study by Alonzo (2016) found that following the Problem Solving and Comprehensive Contact Intervention, 73% patients were attending outpatient treatment, indicating high treatment engagement, although no pre-intervention comparison was possible.

Psychiatric admissions

There was only weak evidence for effects on psychiatric admissions, assessed in three studies. Alonzo (2016) reported that no participants were admitted 3 months after the Problem Solving and Comprehensive Contact Intervention but there was no comparison with pre-intervention admissions, and the Safety Planning intervention with Structured Follow-up led to a non-significant pre-post reduction in suicide-related psychiatric hospitalizations at three months (Stanley et al., 2015).

DISCUSSION

Summary of findings

Fifteen studies of either training interventions for generalist ED providers or interventions delivered by generalist ED providers for patients who self-harm were conducted across five high income countries. Only one RCT was included, demonstrating the very limited evidence base in this area. Training interventions were consistently linked with pre-post improvements in staff knowledge, and less consistently with improvement in skills, attitudes, and confidence. Importantly, evidence on patient outcomes was lacking. Patient-level interventions involving common suicide prevention strategies—safety planning and follow-up contact—were consistently linked to pre-post reductions in suicide attempts across studies Effects on treatment engagement and psychiatric admissions were unclear.

We identified nine studies of training interventions conducted with 1587 generalist ED providers to improve knowledge, attitudes, confidence and skills regarding the epidemiology, risk factors, assessment, and treatment of self-harm. Only one was an RCT. They were of "moderate" (50%) methodological quality. Training appeared to improve provider knowledge, and showed some potential to improve skills, attitudes, and confidence, but studies had significant methodological limitations. Solution Focused Nursing (SFN) appeared to show the most robust qualitative and quantitative evidence for improvements from pre- to post-training in two studies of moderate to good quality (McAllister, Billett, et al., 2009; McAllister, Moyle, et al., 2009). In contrast, the only RCT—while the most rigorous study, found no improved outcomes following a simple poster intervention (van Landschoot et al., 2017). As might be expected, the intensity of the intervention is likely to be a significant factor in changing provider outcomes.

Six studies evaluated psychosocial interventions delivered by ED generalists to 3133 patients presenting to the ED with self-harm. They were of good (75%) methodological quality, however, no RCTs were identified. Interventions tended to focus on safety planning and follow-up contact and were consistently linked to pre-post reductions in

suicide attempts across studies. There was some evidence for better engagement in follow-up outpatient care and weak evidence for fewer psychiatric admissions.

A Safety Planning Intervention with Structured Follow-up appeared to be especially promising, as four independent studies found it was linked to reduced suicidal behavior and increased outpatient treatment attendance (Knox et al., 2012; Stanley et al., 2015, 2016, 2018). However, pre-post designs and lack of a control mean that improvements cannot necessarily be attributed to the intervention.

Comparison of findings with existing research

Common goals of training interventions in suicide prevention

Self-harm training interventions for generalist ED providers are usually brief stand-alone programs, delivered to staff on a voluntary basis (Ferguson et al., 2020). Common objectives are to improve staff knowledge, skills, and attitudes regarding self-harm, ultimately aiming to improve patient care. This is in line with findings that poor knowledge, clinical skills, and negative attitudes, negatively impact staff's ability to provide good quality care (Ferguson et al., 2020; Rothes et al., 2014). Hence, suicide prevention strategies highlight educational initiatives in addition to patient-level interventions. Continuous education in suicide prevention is particularly important in general healthcare settings such as the ED: generalist providers deliver varying levels of mental health care to patients; yet studies have repeatedly identified a lack of adequate training (Brunero et al., 2012; Ferguson et al., 2020; Ross & Goldner, 2009).

In addition to knowledge and skills, previous research identified that staff negative attitudes impact the quality of care for people who self-harm (Ross & Goldner, 2009). Patients often describe ED staff as disrespectful, insensitive, and judgmental, and they frequently feel dismissed and stigmatized (Bradbury, Hutchinson, Hurley, & Stasa, 2017; Digel Vandyk, Young, MacPhee, & Gillis, 2018; Guzmán, Tezanos, Chang, & Cha, 2020). Patients report that these attitudes can be traumatizing, reinforcing negative self-perceptions and hopelessness, reducing future help-seeking, and triggering subsequent episodes of self-harm and suicide (Guzmán et al., 2020). Of five training interventions aiming to promote positive attitudes among staff, only two were effective (Kishi et al., 2014; McAllister, Billett, et al., 2009; McAllister, Moyle, et al., 2009). One of these was solution-focused nursing training, which focused on understanding the feelings of people who self-harm, and on providing compassionate and person-centered care.

Evidence of common suicide prevention strategies among the interventions

Three psychosocial interventions implemented common suicide prevention strategies: follow-up contacts, encouraging patients to attend outpatient treatment, developing coping skills, and safety planning. These strategies have also been implemented and proven somewhat effective for suicide prevention in other psychiatric settings (Asarnow et al., 2011; Inagaki, Kawashima, Yonemoto, & Yamada, 2019; Zalsman et al., 2016).

Follow-up contacts via postcards, letters, and telephone calls, were typically provided shortly after a suicide attempt, when the risk of repetition is highest, and at regular intervals over a set time (Kapur et al., 2013). Follow-up contacts aim to give patients a sense of social connectedness, a known protective factor from suicide (Milner, Carter,

Pirkis, Robinson, & Spittal, 2015). However, past research found follow-up contacts alone to be ineffective: two meta-analyses concluded the evidence was not sufficiently strong for it to be recommended (Hawton et al., 2016; Milner et al., 2015). If implementing this approach, multiple forms of follow-up contacts of a personalized rather than a generic nature is recommended. The included psychosocial interventions followed this recommendation by combining follow-up contacts with more intensive and personalized elements.

The ED Safety Assessment and Follow-up (Miller et al., 2017) intervention and the Safety Planning with Structured Follow-up (Knox et al., 2012; Stanley et al., 2015, 2018) both focused on engaging patients in follow-up care by maintaining regular contacts, sending appointment reminders, and highlighting the benefits treatment. Both studies found reductions in re-attempts, and the Safety Planning with Structured Follow-up effectively increased treatment-engagement. Increasing follow-up outpatient attendance may be an important mechanism to improve outcomes as many do not attend or drop out of treatment quickly (Knesper, 2011; Stanley & Brown, 2012). This also addresses challenges with simple referrals as patients are unlikely to attend treatment without motivation to do so (Knesper, 2011). Given the risk of suicide is highest shortly after presenting to the ED, timely intervention is critical so that patients can begin treatment as soon as possible (Bostwick, Pabbati, Geske, & McKean, 2016).

Safety plans are documents that support and guide people when experiencing suicidal thoughts, to prevent them from acting on them (Berk & Clarke, 2019). Safety planning was an integral aspect of the Safety Planning with Structured Follow-up (Knox et al., 2012; Stanley et al., 2015, 2018), which was developed based on a Safety Planning Intervention (SPI) by Stanley and Brown (2012). This consists of helping patients to identify personal warning signs of a developing suicide crisis, strategies to cope with subsequent suicidal feelings, available supports during a suicidal crisis, and ways to reduce access to lethal means.

Unclear contribution of individual intervention components

The contribution of individual intervention components toward reductions in self-harm is unclear. However, some studies did consider this issue. Miller et al. (2017) concluded that as they implemented three components (suicide risk screening, safety planning, and follow-up) it was not possible to identify their individual contributions. However, they note that while some participants did not receive all three components, all received substantial outreach via telephone messages and letters. Thus, supportive follow-up messages may have had a beneficial effect. In contrast however, Stanley et al. (2018) conducted mediation analysis, which suggested that increased treatment engagement and follow-up calls were not associated with decreased suicidal behavior, possibly pointing to a key role of the safety plan. Intervention effectiveness may also depend on the quality of standard care, which varied considerably between the studies. the Safety Planning with Structured Follow-up was implemented in Veterans Affairs ED, where standard care for suicidal individuals included evidence-based screening, assessment, and treatment (Knox et al., 2012; Stanley et al., 2015, 2016, 2018). Thus, the extent to

which these interventions reduce future self-harm might differ if delivered in EDs with less well-developed usual care.

Limited generalizability of findings

The characteristics of the study samples may limit the generalizability of findings. Knox et al. (2012) and Stanley et al. (2015, 2018) studied veteran populations, many of whom were diagnosed with PTSD, depression, and substance abuse. However, Stanley et al. (2018) found that these diagnoses were not associated with suicidal behavior during follow-up. Nonetheless, the sample consisted of young white men, which may limit the generalizability to patients of other gender, age and ethnicity (Knox et al., 2012; Stanley et al., 2015, 2018). Finally, ED staff who participated in the training studies were often people interested in learning and improving their knowledge and skills, which likely does not necessarily reflect less motivated staff.

Strengths and limitations

This is the first systematic review of training interventions for generalist ED providers managing patients with self-harm and psychosocial interventions for patients with self-harm delivered by generalist ED providers, and their impact on staff and patients' clinical outcomes. It was conducted and reported using PRISMA guidelines and used a thorough search strategy. Although meta-analysis was not appropriate, a narrative synthesis allowed for a comprehensive summary of the evidence. It is possible that some eligible studies were missed, especially because of the exclusion of non-English language papers and gray literature. It is also possible that the language restriction only allowed us to include studies conducted in high-income countries with strong health care systems, which limits the generalizability of findings worldwide.

Implications for research and practice

Despite the better methodological quality of psychosocial intervention compared to training studies, there is a clear need for further RCTs in this area.

Future research on staff training interventions should use larger and more representative samples, validated measures, direct observations of skills change, and longer-term follow-up to investigate longer-term sustainability. Importantly, the findings indicate the impact of staff training on patient outcomes is lacking. future research should incorporate explicit measures to evaluate whether staff training leads to improved patient outcomes.

Another key focus of future research on staff training interventions should be addressing negative staff attitudes, possibly by involving people with experience of attending the ED for self-harm. An interesting area for future work would also be to assess intervention effects on staff well-being. Healthcare professionals working in acute settings and with vulnerable populations are under intense pressure, which can lead to burnout, anxiety and even PTSD (DeLucia et al., 2019; Hall, Johnson, Watt, Tsipa, & O'Connor, 2016; Stehman, Testo, Gershaw, & Kellogg, 2019). Alarming figures of approximately 18% of nurses and 15–17% of ED physicians meeting diagnostic criteria

for PTSD, indicate an urgent need in this respect. Additionally, future initiatives might consider offering healthcare staff some kind of incentive, such as CPD (continuing professional development) credits for their participation in training in order to ascertain the impact of mandatory training.

Future research on patient-level interventions should implement more RCTs, as controlled evidence is lacking. It is also important to address generalizability and conduct subgroup analysis to account for possible differences in effects (e.g., gender, ethnicity, age and psychiatric history). Differences in prevalence of self-harm and accessibility of healthcare are reported among certain age groups, and self-harm is more commonly reported among minoritized groups such as ethnic minorities and LGBTQ + groups. Future studies should investigate these differences so that interventions are also effective for minoritized groups.

Only two of the psychosocial intervention? studies assessed acceptability. Given that acceptability is recognized as critical to the successful implementation and subsequent effectiveness of interventions (Sekhon, Cartwright, & Francis, 2017, 2018), future studies should address acceptability as an important outcome. Finally, it would be useful to examine the effects of specific intervention components and how they compare to well-defined TAU. Process evaluations to unpack how specific components work in practice that involve service users in intervention planning and delivery, would bring valuable insights into what works for whom and how (Brunero et al., 2012; Ferguson et al., 2020).

CONCLUSION

There is a clear need for RCTs to further strengthen the evidence base for ED generalist providers managing patients with self-harm. Despite the study limitations, there is a picture emerging from the evidence. Firstly, there is some evidence that training improves generalist ED staff knowledge, attitudes, and skills in assessing and providing compassionate care for people with self-harm. However, it needs to be sufficiently intensive and interactive, with solution focused nursing training offering one such approach. Secondly, safety planning and follow-up contacts can be delivered by generalist ED providers and are linked to reductions in repeat suicide attempts.

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