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Citation: Ramachandran, A., Hilari, K., Epstein, R., Devane, N. & Hirani, S. P. (2025). Voice related coping in professional voice users - a systematic review. *Journal of Voice*, 39(2), 562.e17-562.e31. doi: 10.1016/j.jvoice.2022.08.024

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Voice Related Coping in Professional Voice Users-A Systematic Review

*Aparna Ramachandran, *Katerina Hilari, ^{†,*}Ruth Epstein, *Niamh Devane, and *Shashivadan P. Hirani, ^{*†}London, and [‡]United Kingdom

Summary: Objectives. This systematic review explored coping with voice problems in professional voice users. The objectives were to: 1) evaluate how voice-related coping is assessed in professional voice users 2) investigate how they cope with voice problems, and 3) identify factors associated with voice-related coping.

Design. Systematic review.

Methods. A systematic literature search of ten electronic databases using both EBSCOhost and OVID online platforms was conducted following the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines. Only peer-reviewed articles which assessed coping in the context of voice problems in professional voice users were included. Methodological quality was assessed using Johanna-Briggs Institute Critical Appraisal checklists. Data analysis was conducted using narrative synthesis.

Results. Following deduplication, abstract and full-text screening, seven articles were included in the review. All participants (n=2484) were teachers; no other professional voice users were covered. 98% of the cases studied were females. The tools used to assess voice-related coping were Utrecht Coping List (UCL) and Voice Disability Coping Questionnaire (VDCQ). Studies which used UCL reported a passive coping pattern in teachers with high vocal handicap whereas VDCQ showed increased use of social support. Factors associated with coping were not examined by any of the studies.

Conclusion. Seeking social support was highlighted as a frequently used coping strategy across studies and measures. Teachers with high vocal handicap used a passive coping pattern and active coping styles were not significantly used. Current evidence does not sufficiently specify factors affecting coping in professional voice users. More research on voice-related coping involving all professional voice users is warranted to identify associated factors and further ascertain its influence on vocal health.

Key Words: Coping—Dysphonia— Voice disorders— Patient reported outcome measures.

INTRODUCTION AND OBJECTIVES

Professional voice users are individuals whose ability to earn a living is impacted negatively by loss of vocal quality and endurance.¹ This includes singers, teachers, actors, lawyers etc. The reported lifetime prevalence of voice problems is estimated to be between 50%-80% in teachers^{2,3} in contrast to 29.9%⁴ in the general population. Other professional voice groups such as singers⁵ and telemarketers⁶ have also shown higher prevalence rates (46.09% and 68% respectively) which makes professional voice users a vocally vulnerable group.

Given higher prevalence rates and increased impact of voice problems, it becomes essential to explore how professional voice users manage these voice problems. This is often referred to as coping, which is defined as an adaptational response to a situation or 'stressor' using cognitive or behavioral processes to manage the stress of illness.⁷

Many classifications of coping have been proposed, of which problem-focused vs emotion-focused⁷ and active vs passive coping⁸ are most common. Research indicates that problem-focused and active coping can be positively linked to increased well-being whereas emotion-focused and passive coping is associated with negative health outcomes.⁹ However, such classifications only provide a general description of how an individual copes with an illness and do not take into account the context or the variability across the trajectory of an illness. Recent scales such as the Voice Disability Coping Questionnaire (VDCQ)¹⁰ provide a multi-dimensional and context-specific description of coping using subscales.

Studies on coping in the context of voice problems are scarce; however, type of voice disorder and severity have been reported to influence how individuals cope with voice problems. Epstein et al (2009) studied coping in two clinical groups namely Muscle Tension dysphonia (MTD) and Adductor Spasmodic Dysphonia (ASD) and reported that avoidance and passive coping were used by the latter group significantly more than the former. This demonstrates the relevance of coping in differentiating between clinical groups and targeting adaptive coping during intervention. De Freitas Valadares, Occhi-Alexandre and Teixeira (2020)¹¹ also reported that reliance on emotional coping strategies increased with increased severity of dysphonia.

Coping forms an important mediating link between the way individuals view their illness and how health outcomes are appraised¹² (Figure 1). Therefore, coping is directly

Accepted for publication August 19, 2022.

From the *School of Health and Psychological Sciences, City, University of London, London, United Kingdom; †Department of Speech and language therapy (ENT), Royal National Ear Nose and Throat and Eastman Dental Hospital, London, United Kingdom; and the ‡Division of Surgery and Interventional Science, University College London, London, United Kingdom.

Address correspondence and reprint requests to Aparna Ramachandran, School of Health and Psychological Sciences, City, University of London, London, United Kingdom. E-mail: aparna.ramachandran@city.ac.uk

Journal of Voice, Vol. ■■■, No. ■■■, pp. ■■■–■■■
0892-1997

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<https://doi.org/10.1016/j.jvoice.2022.08.024>

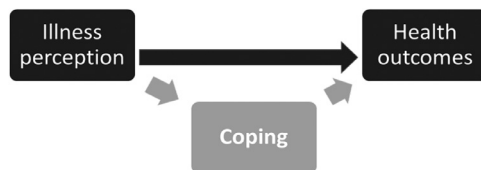


FIGURE 1. Figure explaining the mediating role of coping.

related to the physical and functional outcomes of a voice problem.¹³ Consequently, coping can be associated with onset and development of a voice problem,¹⁴ particularly in professional voice users who require a high level of vocal skills such as teachers and singers.

The objective of this paper was to identify and analyze the available research evidence pertaining to voice-related coping in professional voice users. The review will summarize relevant data and provide implications for vocal health and identify gaps that need to be addressed in future research. More specifically, the review aimed to address the following questions:

1. How is voice-related coping assessed in professional voice users?
2. How do professional voice users cope with voice problems?
3. What factors are associated with different coping strategies addressing voice problems in professional voice users?

METHODS

The methods and reporting of this review complied with the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines.¹⁵ PROSPERO and Cochrane databases were searched to establish the absence of a current or recent review in the area.

Eligibility criteria

To be eligible studies had to address coping in the context of voice problems in professional voice users. All study designs were eligible. To be included, studies had to measure coping in a valid and reliable manner, using standardized measurement procedures; i.e. voice and coping outcomes had to be measured with psychometrically sound measures (for studies presenting quantitative data), or established ways of analyzing data (for qualitative studies). Studies that measured multiple outcomes, of which coping was one, were included if coping measures were discussed separately.

Studies were excluded if they explored coping related to performance anxiety, or any other 'non-vocal' parameter; as were reviews, editorials or unpublished theses/dissertations or articles published in non-peer reviewed journals or magazines.

Information sources

A systematic search using 10 electronic databases (Medline Complete, Academic Search Complete, CINAHL, EMBASE, Music Periodicals, Communication Source, PsycINFO, SCOPUS, Web of Science and NICE) was carried out in February 2020 and regular search alerts were set up to ensure no recent publications were excluded from the review. Searches were last re-run in March/April 2022. Grey literature was also searched using OpenGrey and BASE databases. Citation and reference tracking were carried out for all the studies which were included at the end of the selection process to check for articles which may not have been picked up during database searching.

Search strategy

A subject librarian was consulted to develop the search strategy. Each database was searched separately using a customized search strategy which included keywords and subject terms using EBSCO Host and Ovid platforms. The basic search strategy is provided in Appendix 1.

Selection process

The studies retrieved were first imported into Rayyan¹⁶ for duplicate removal and study selection; following which, the selected articles were transferred into EPPI-Reviewer,¹⁷ for data extraction and data synthesis. The entire screening process was carried out by AR. The title and abstract of the articles were screened against the eligibility criteria to identify studies to include in the review and reasons for exclusion were clearly documented. The full text of all the articles which fulfilled the eligibility criteria was retrieved and reviewed. 25% of articles were screened at both title and abstract and full text level by a second reviewer (ND) who worked independently and was blinded to decisions made by the first reviewer. Disagreements on study selection were discussed by the reviewers for resolution. For papers where a consensus could not be reached between the reviewers, a senior member of the research team (SPH) was consulted for a final decision.

Data collection process

Data was extracted by AR following which 25% of studies were independently double screened to check for consistency of extracted data (ND). A data extraction table was created to collect information pertaining to study and participant characteristics, assessment methods, coping related outcomes and factors influencing coping. Disagreements in decisions surrounding extracted data were discussed by the reviewers for resolution. When a consensus could not be reached, a senior member of the research team (SPH) was consulted for advice regarding reconciliation.

Data items

Data extracted included title, authors, year of publication, study design, country, participants, population size and

distribution, demographic characteristics, work experience of participants, response rate, objectives (of the study), inclusion/exclusion criteria, measures used to assess coping, coping related outcomes, factors influencing coping and key conclusions. Authors were contacted ($n=3$) if more information was required to aid in data synthesis. After the initial e-mail, one more reminder was sent to the authors.

Risk of bias assessment

The Joanna-Briggs Institute (JBI) Critical Appraisal checklists were used for assessing methodological quality and risk of bias. Since not all the selected studies had the same design, different JBI critical appraisal tools suitable for specific study designs were adopted. The JBI does not provide clear guidelines on including or excluding articles based on quality; therefore, a review specific scoring system was developed to aid in quantifying the decision-making process. The responses outlined in JBI were assigned values as follows:- All responses marked yes were given a value of 2, responses marked no were given a value of 0 and those marked unclear were assigned a value of 1. For each study, the total percentage score was calculated, and this value was compared across studies. A cut-off paradigm was then developed by the authors and the scores were interpreted as follows:

- Scores > 80%= Good methodological quality
- Scores between 60-80%= Fair methodological quality
- Scores < 60%= Poor methodological quality

If any studies were of poor methodological quality, they were not included in the synthesis of the results.

A second reviewer (ND) carried out an independent quality appraisal assessment, the results of which were discussed with the first reviewer (AR). Any discrepancies that arose were discussed by the reviewers. When a consensus could not be reached, a senior member of the research team was consulted for advice regarding reconciliation (SPH).

Data synthesis

Heterogeneity assessment was done using the I^2 measure to ascertain if a meta-analysis could be performed with a fixed or random measure and calculate a pooled estimate. As a meta-analysis could not be performed, a narrative synthesis was performed. The first step was familiarizing with the included studies. This was done by systematically and comprehensively reading each study and highlighting important characteristics. Each study was described in detail and all key features were summarized for each study. The studies were then tabulated to identify patterns across the included studies. Between and within study differences were explored and this data was used to highlight assessment methods, describe voice related coping in professional voice users, identify factors affecting coping and ascertain the relationship between voice problems and coping in the study population.

RESULTS

Study selection

The searches identified 2474 articles. Following deduplication, title and abstract screening, and full text screening, seven studies were included in the review. Figure 2 provides the PRISMA flow diagram and further details regarding the study selection process and reasons for study exclusions.

The percentages of agreement between the raters involved in double coding were 88.2% and 100% for title and abstract and full text screening respectively. All discrepancies were resolved by the reviewers following discussion.

Study characteristics

Study characteristics are detailed in Table 1. The publication dates of the studies ranged from 2003-2017 spanning a period of 15 years. Of the seven included studies, three took place in the Netherlands,¹⁸⁻²⁰ two in Brazil,^{21,22} one in Sweden²³ and one in Belgium.¹⁴ Five studies employed a cross sectional study design with a control group, while the other two used a case control²³ and a longitudinal²⁰ study design.

Participant characteristics

All studies included in the review involved teachers and/or student teachers; no studies involving other professional voice users were identified. The sample sizes ranged from 43²⁰ to 911.¹⁸ The mean age of participants ranged from 18.6 years²⁰ to 48.7 years²³ and the age range, in the studies that reported it, was 16-62. Five studies recruited only women.^{14,19-22} There was a total of 1322 female cases, 26 male cases (total $n=1348$) and 1136 control subjects. Since information regarding sex was not provided in the largest study¹⁸ for the control group, the number of males and females in the control groups across the review could not be generated. The participants ranged from student teachers to primary and secondary school teachers.

Methodological quality

The cross-sectional studies ($n=5$), and the case-control study ($n=1$) were assessed using the JBI tool designed specifically for these study designs. Since a critical appraisal tool specifically designed for longitudinal studies could not be found, the JBI cohort design tool was used for assessing the quality of the longitudinal study ($n=1$). The initial agreement between the reviewers was 61%. The items with disagreements were discussed between the raters and consensus was reached (100% agreement) for all items. Only one study was rated as of good methodological quality²³ and the other studies ($n=6$) were of fair quality. Table 2 describes the results of the quality assessment with individual item scores.

Since the studies were of acceptable methodological quality, all seven studies were taken forward for data synthesis.

Assessment of coping

The Utrecht Coping List (UCL)²⁴ was used in four studies^{14,19,20,23} all of which were undertaken in Europe.

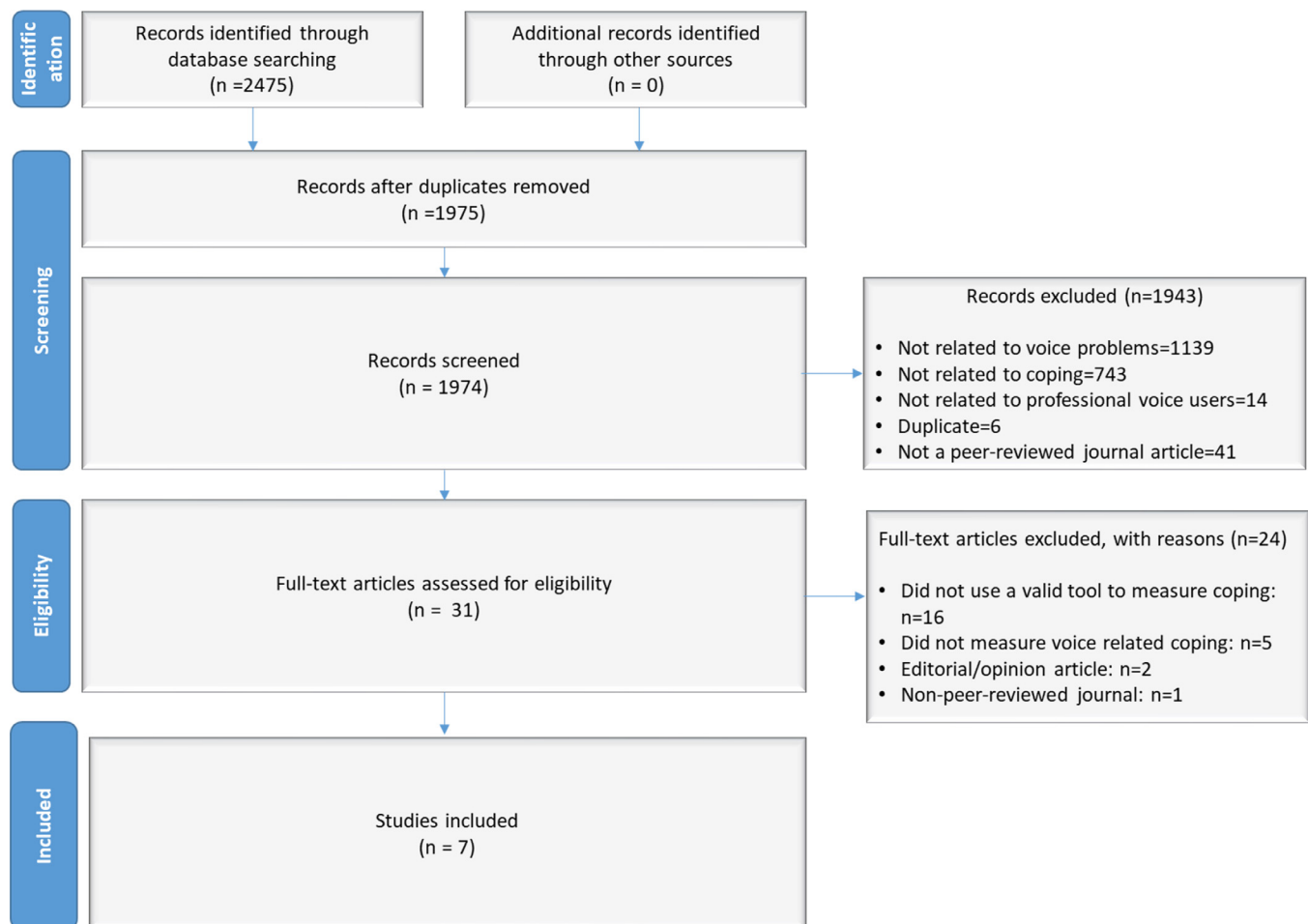


FIGURE 2. PRISMA Flow Diagram illustrating the study selection process.

UCL is a questionnaire which assesses the general coping style of individuals using 47 questions across seven subscales (Table 3). One study used only some sections of the UCL (22 out of 47 questions). The two Brazilian studies used the Voice Disability Coping Questionnaire (VDCQ).¹⁰ VDCQ has 15 items across four subscales which helps to generate a coping profile to evaluate how individuals cope with voice problems. However, they used an earlier version of VDCQ with 27 items, which was culturally adapted and translated to Brazilian Portuguese, where items are classified as ‘problem focused’ or ‘emotion focused’ strategies instead of the four subscales described in the original VDCQ. The various coping subscales measured by UCL and VDCQ and their definitions are provided in Table 3.

One study¹⁸ used a different approach where coping was conceptualized and assessed based on the principles of the psychological cascade model.²⁵ The psychological cascade model describes three phases from dysfunction to recovery—phase 1, where the patient considers the disorder a threat which is characterized by anxiety, fear and terror of loss, struggle against the loss, searching for help, exhaustion and isolation, and depression; phase 2 (called the pit), characterized by surrendering to the loss without giving up; phase 3 which is characterized by hope and renewal which may lead

to recovery. The model also describes some maintaining factors and coping strategies (described in terms of externalization, dependence and awareness) which is believed to influence transition between the phases. According to the model, a patient proceeds from phase 1 to phase 2 if the maintaining factors are absent and coping strategies are adequate. Alternatively, if coping is inadequate and the maintaining factors are too strong, the patient may be in a deadlocked situation of phase 1 thereby promoting chronicity.

Coping strategies used by professional voice users to manage voice problems

The findings have been organized based on the assessment tool since the constructs used to measure coping are different in the UCL (seven subscales) and VDCQ (problem-focused vs emotion-focused).

Of the four studies that used UCL to assess coping, two studies^{14,19} reported the median values of the UCL subscales for teachers with low and high vocal handicap measured using the Voice Handicap Index. The combined median scores of the two groups (high and low vocal handicap) across both studies are presented in Figure 3.

TABLE 1.
Description of Study Characteristics

Study Name	Country	Participants	Age Mean, (SD), Range	Sex		Study Design	Response Rate
				Males	Females		
Ahlander (2012)	Sweden	Total N=62 N=31: Teachers with self-reported voice problems having 15 years of teaching experience (Cases) N=31: Age, gender and school matched teachers without self-reported voice problems having 15 years of teaching experience (Controls)	Mean ages: Cases=48.7 (10.7); Controls=44.6 (9.9)	Group 1=5 (16.12%) Group 2=5 (16.12%)	Group 1=26 (83.87%) Group 2=26 (83.87%)	Case control	47.10%
De Jong (2003)	NL	Total N=911 N=76: Primary and secondary teachers with self-reported voice problems (Cases) N=835: Primary and secondary teachers without self-reported voice problems (Controls/comparison group)	Mean age: cases=45 (NR); Controls: NR Age range: cases=23-59 (NR); Controls: NR	Cases=21 (27.63%)	Cases=55 (72.36%) Controls-No info	Cross-sectional with comparison group	NR
Ferracciu (2015)	Brazil	Total N=110 N=39: Elementary school teachers with voice disorder (based on 100mm VAS: >35mm) (Cases) N=71: Elementary school teachers without voice disorder (based on 100mm VAS: <35mm) (Controls/comparison group)	Mean age=45.81 (7.41) - Age range=29-62	-	Females only=110	Cross sectional with comparison group	NR
Meulenbroek (2010a)	NL	Total N=755 N=186: Student teachers with high vocal handicap (75 th percentile of VHI) (Cases) N=167: Student teachers with low vocal handicap (25 th percentile of VHI) (Controls/comparison group) N=402 moderate handicap (not analyzed)	Mean age=18.8 (NR) Age range=16-29	-	Females only=755	Cross sectional with comparison group	100%
Meulenbroek (2010b)	NL	Total N=43 Student teachers having 2 training periods (2 days a week for 25 days)	Mean age=18.6 (NR) Age range=17-23	-	Females only=43	Longitudinal survey	42%
Van Wijck-Warnaar (2010)	Belgium	Total N=470 N=230: Primary school teachers with voice problems of which N=56 have high vocal handicap (75% percentile of VHI scores) and N=54 have low vocal handicap (Cases) N=240: Females from general population (Controls/comparison group)	Mean ages: Teachers=36.3 (NR) Controls=40.4 (NR) Age Range Teachers=21-60; controls=21-59	-	Females only Cases=230 Controls= 240	Cross sectional with comparison group	Teachers= 51% Controls=60%
	Brazil			-			NR

(Continued)

TABLE 1. (Continued)

Study Name	Country	Participants	Age Mean, (SD), Range	Sex		Study Design	Response Rate
				Males	Females		
Zambon (2014)		Total N=90 N=30: Primary, middle and high school teachers with self-reported voice problems who sought voice therapy (Cases-Group 1) N=30: Primary, middle and high school teachers with self-reported voice problems who did not seek voice therapy (Cases-Group 2) N=30: Primary, middle and high school teachers without self-reported voice problems (Controls/comparison group-Group 3)	Mean ages: Group 1=26.2 (7.5); Group 2=35.1 (7.9); Group 3=37.2 (9.8) Age range: Group 1=23-49; Group 2=21-51; Group 3=23-66		Females only=90	Cross sectional with comparison group	

Abbreviations: NL, Netherlands; SD, Standard Deviation; NR, Not Reported; VAS, Visual Analogue Scale; VHI, Voice Handicap Index.

A comparison of the UCL scores of the two teacher groups in the two studies with the normative scores of the UCL subscales²⁴ revealed the following patterns:

- Teachers with low vocal handicap tended to mirror the normative curve closely, barring the social support subscale, which was higher in both groups of teachers than the controls.
- Teachers with high vocal handicap used more passive coping than teachers with low vocal handicap and the controls, indicated by higher scores in the subscale 'passive reaction pattern'.
- Teachers with high vocal handicap used lesser active coping than teachers with low vocal handicap and the controls, indicated by lower scores in the subscale 'active confrontation or dealing with the problem'.

To summarize, teachers in general used social support more than the control groups (based on the published normative scores), while teachers with high vocal handicap employed more passive coping and less active coping.

A summary of coping patterns based on UCL subscale scores is presented in Table 4 for three studies where subscale scores were available.^{14,19,20} In comparison to teachers with low vocal handicap, three studies reported higher scores on the 'passive reaction pattern' subscale, in teachers with higher vocal handicap. Results also showed that teachers with high vocal handicap were less likely to use "active confrontation or dealing with the problem" and "reassuring thoughts" strategies to cope with vocal handicap.

One study did not report the UCL subscale scores; however, they indicated that there was no significant difference in UCL scores between teachers with and without self-reported voice problems.²³ All further details pertaining to results are described in Table 5.

Ticks indicate strategies used more and crosses indicate strategies which are unlikely to be used in teachers with voice problems.

Table 6 presents the synthesis of 10 most reported items by groups with voice disorders from the two studies^{21,22} that used the VDCQ. Overall, results of 99 patients were analyzed. Five problem-focused and four-emotion focused strategies were reported across the two studies. Additionally, we attempted to classify these items based on the original four subscales of the VDCQ namely information seeking, seeking social support, passive coping and avoidance. This was done by cross referencing these items with the original published article of the standardization of the VDCQ.¹⁰ The frequency of occurrence of each subscale is provided in Table 6. The results of the VDCQ suggested that seeking social support was the most commonly used mode of coping whereas avoidance was used the least.

De Jong (2003)¹⁸ did not use a standardized coping assessment tool since the parameters considered for assessment in the study were directly linked to the psychological cascade model.²⁴ The results revealed that coping contributed to patients remaining in phase 1 of the psychological

TABLE 2.
Quality Assessment of the Selected Articles Using the Joanna Briggs Institute Critical Appraisal Tools

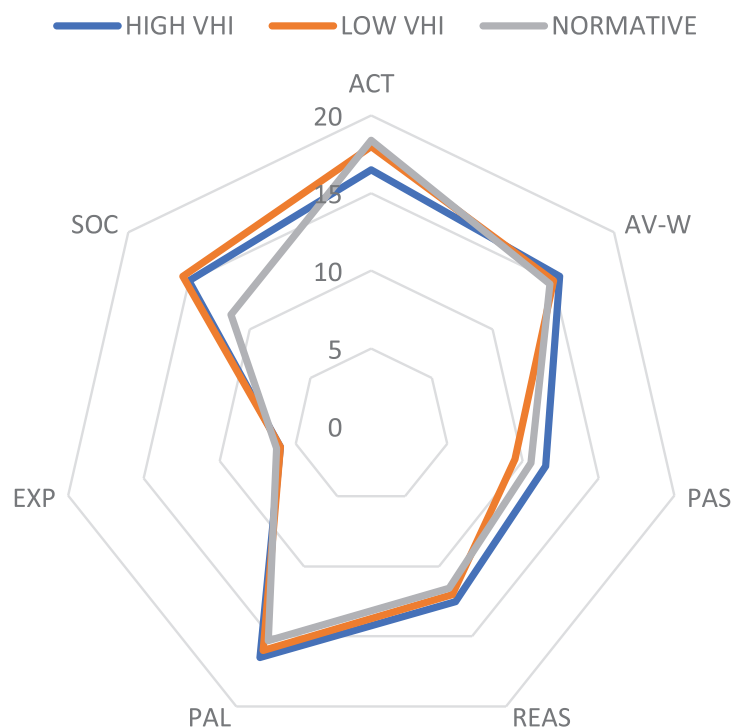
	Ahlander (2011)	De Jong (2003)	Ferracciu (2015)	Meulenbroek (2010a)	Meulenbroek (2010b)	Van Wijck-Warnaar (2010)	Zambon (2014)
Comparability Of Groups (For Case Control studies)	2	NA	NA	NA	NA	NA	NA
Matching of Cases and Controls (For Case Con- trol Studies)	1	NA	NA	NA	NA	NA	NA
Same Criteria for Identifi- cation of Cases and Controls (For Case Con- trol Studies)	2	NA	NA	NA	NA	NA	NA
Clearly Defined Inclusion Criteria	NA	2	1	2	NA	1	2
Description of Sample And Setting	NA	1	1	1	NA	1	1
Valid and Reliable Mea- surement of Exposure	2	2	1	1	1	2	1
Same Measurement of Exposure for Cases and Controls (For Case Con- trol Studies)/ Free of exposure at start of study (For longitudinal study)	2	NA	NA	NA	1	NA	NA
Measurement of Condi- tion Using Objective Standard Criteria	NA	2	2	1	NA	1	1
Identification Of Con- founding Variables	1	1	2	2	2	1	2
Strategies Adopted to Deal with Confounding Variables	1	1	2	2	2	1	1
Valid and Reliable Mea- surement of Outcomes	2	1	0	1	2	2	0
Adequate Duration of Exposure (Only Applica- ble for Case Control and longitudinal Studies)	1	NA	NA	NA	2	NA	NA
Appropriate Statistical Analysis	2	2	2	2	2	2	2
Completion of follow up (For longitudinal studies)	NA	NA	NA	NA	0	NA	NA
Utilization of strategies to address incomplete follow-up (For longitu- dinal studies)	NA	NA	NA	NA	0	NA	NA
Total Score	16/20	12/16	11/16	12/16	12/18	11/16	10/16
Total Score (%)	80%	75%	69%	75%	67%	69%	63%
Quality Level	Good	Fair	Fair	Fair	Fair	Fair	Fair
Include/Exclude	Include	Include	Include	Include	Include	Include	Include

cascade model where the patient continues to view the problem as a threat and is anxious, struggling, exhausted and potentially depressed as a result of remaining in phase 1. Of these factors, externalization (whether the patient

experienced the causes and solutions of problems as being beyond his control) and unawareness (awareness of whether one was actually in phase 1 of the psychological cascade model) were most correlated with phase 1. Due to

TABLE 3.
Details of Coping Subscales Measured by UCL²⁴ and VDCQ¹⁰

Voice Disability Coping Questionnaire		
Subscale	Definition	No: of items in each subscale
Information seeking	"Problem solving coping through seeking information about the condition"	2
Passive coping	"Individuals who do not embrace or reject any proactive coping strategy"	4
Avoidance	"Use of denial, withdrawal, and reorganization of routine activities in the face of dysphonia"	3
Social support	"Range of interpersonal exchanges that provide the individual with information, emotional reassurance, material assistance and self-esteem"	6
Utrecht Coping List		
Subscale	Definition	Number of items in each subscale
Active handling	Active approach to solve a problem where the problem is thought about and approached directly	7
Palliative Reactions	Efforts directed at changing the feelings elicited by a problem.	8
Avoidance/waiting	No effort to change the problem itself, but avoiding the problem or situation	8
Seek social support	Worries are shared with someone	6
Passive reactions	Feelings of helplessness or being pessimistic and overwhelmed by the problem	7
Expression of emotions	Expressing feelings about the problem to others	3
Reassuring thoughts	Engaging in self-encouragement and comforting thoughts	5



VHI=Voice Handicap Index, ACT=Active confrontation or dealing with the problem, Av W=avoidance/waiting, PAS=passive reaction pattern (PAS), REAS=reassuring thoughts, PAL=palliative reactions, EXP=emotional expression, SOC=seeking for social support

FIGURE 3. Comparison of UCL scores of teachers with low and high vocal handicap and normative scores.

TABLE 4.
Coping Patterns Seen in Teachers With High Vocal Handicap Based on UCL Subscales

Study	Active Confrontation or Dealing With the Problem	Avoidance-Waiting	Passive Reaction Pattern	Reassuring Thoughts	Palliative Reactions	Emotional Expression	Seeking for Social Support
Meulenbroek (2010a)		✓	✓		✓	✓	
Meulenbroek (2010b)			✓	X			✓
Van-Wijck Warneer (2010)	X		✓				✓

TABLE 5.
Synthesis of Outcomes Reported in the Included Studies

Study Name	Objectives	Eligibility Criteria	Coping Related Outcomes	Key Study Conclusions
Ahlander (2011)	1. Compare teachers with and without self-reported voice problems and relate the self-assessed voice function to laryngeal findings, voice quality, personality and psychosocial circumstances such as burnout and coping.	Inclusion: 1. Cases and controls belong to the same school 2. Subjectively free from upper airway infections and allergies	No significant differences between teachers with and without self-reported voice problems	1. No significant differences were found within the pairs with respect to coping strategies.
De Jong (2003)	1. Describe the factors that maintain the voice problem and the way in which teachers with chronic voice complaints cope with their voice problem 2. Address the question whether a parallel can be drawn to the psychological cascade model	1. A history of persisting voice problems 2. A previous or present period of absence from work due to voice problems.	Number of patients in: Phase 1: 54 (71%) Phase 2: 12 (16%), Phase 3: 11 (14%) 1. Unawareness: present in 30 patients (39%) 2. Externalization: present in 57 patients (75%). 3. Dependence: present in 51 patients (67%) Significant difference between patients in phase 1 and not in phase 1 with respect to prevalence of: a. unawareness: $p=0.001$ b. externalization: $p\text{ value}=0.001$ c. dependence: $p=0.015$ d. VAS: $p=0.039$ Factors significant to classify patients into phase 1 or not in phase 1 a. unawareness: $p=0.033$ b. Externalization: $p=0.009$ VDCQ results-frequency of 5 most reported items for groups with and without (in brackets) voice disorder	1. Organic lesions may not be responsible for maintaining a voice problem. 2. The positive correlation between the maintaining and coping factors and the severity of voice complaints suggest that these factors play a role in keeping up the voice problem. 3. Patients found in phase 1 are in a deadlocked situation due to the 3 ways of coping-externalization, unawareness and dependency.
Ferracciu (2015)	Assess the association between voice disorders with sociodemographic	Exclusion: Males	VDCQ results-frequency of 5 most reported items for groups with and without (in brackets) voice disorder	1. No significant differences in coping reported between the groups

(Continued)

TABLE 5. (Continued)

Study Name	Objectives	Eligibility Criteria	Coping Related Outcomes	Key Study Conclusions
	characteristics, vocal aspects, types of coping strategies and vocal impact on daily activities.		Item 1: "It helps me to cope with my voice problem if other people are sympathetic"- 94.9%, (87.3%) Item 8: "I find it easier to cope with my voice problem by finding out as much about it as I can" 87.2%, (84.5%) Item 13: "I find it easier to cope with my voice problem if I ask the doctor questions about it"- 87.2%, (83.1%) Item 24: "Resting my voice at times, helps me cope with my voice problem" 87.2%, (78.9%) Item 15: "I find it easier to cope with my voice problem by wishing that it would go away or somehow be over with"- 84.6% (only group with voice disorder) Item 2: "I try to avoid situations where my voice problem would become evident" (77.5%) (only group without voice disorder)	2. Slightly inclined to use more problem focused strategies although not statistically significant
Meulenbroek (2010a)	Investigate coping behavior in relation to the biopsychosocial impact of the voice in female student teachers.	Exclusion: Male students	PAL VHI>75-17 (10-25), VHI<25-16 (8-24); p<0.001 AV-W VHI>75-16 (11-26) VHI<25-15 (8-24); p<0.001 PAS VHI>75-11 (7-21) VHI<25-9 (7-20); p<0.001 EXP VHI>75-6 (3-11) VHI<25-6 (3-11); p<0.003	1. Student teachers with relatively high VHI scores showed higher scores on all subscales related to a passive coping style such as PAS, AV-W and PAL
Meulenbroek (2010b)	Investigate the relation between trainee periods and voice handicap, the general coping style and psychosomatic well-being in starting student teachers	Exclusion: Male students	Difference in VHI total scores in relation to UCL subscale scores PAS Higher VHI- PAS LOW=3 (30) PAS HIGH=7 (70) Lower VHI PAS LOW=22 (66.7) PAS HIGH=11 (33.3); p=0.039 SOC Higher VHI- SOC LOW=5 (50) SOC HIGH=5 (50) Lower VHI SOC LOW=20 (76.9) SOC HIGH=13 (23.1); p=0.551 REAS Higher VHI- REAS LOW=8 (80) REAS HIGH=2 (20) Lower VHI REAS LOW=21 (63.6) REAS	1. At the end of training period, 40% students showed more passive coping modes. 2. Students with high VHI at the end of training showed higher scores in PAS and higher risk for higher score in SOC and lower risk of higher score in REAS. 3. Overall coping style is more passive than

(Continued)

TABLE 5. (Continued)

Study Name	Objectives	Eligibility Criteria	Coping Related Outcomes	Key Study Conclusions
			HIGH=12 (36.4); p=0.333	active.
Van Wijck-Warnaar (2010)	Explore the general coping style of female teachers who report a relatively low voice handicap compared with teacher who report a relatively high voice handicap.	Exclusion: Males	Median and (IQR values) and significance value: Teachers: ACT low VHI-19.0 (3.00), high VHI-16.0 (4.25); p =0.001 PAS low VHI-10.0 (3.00), high VHI-12.0 (5.00); p =0.001 General population and teachers irrespective of vocal handicap SOC p =0.001 (mean and IQR values not provided) General population and teachers-high voice handicap SOC Teachers-15.0 (6.00), Controls-13.0 (5.25); p =0.022 AV-W Teachers-15.0 (4.00), Controls-16.0 (3.00); p=0.027	1. Teachers with high VHI cope overall with a passive reaction pattern and less with an active coping style. 2. Teachers in general tend to seek for social support.
Zambon (2014)	1. Understand coping strategies used by teachers with vocal complaint 2. Compare the differences between those who seek and do not seek treatment 3. Check relationship between coping and perceptual analysis, vocal signs and symptoms and VAPP	Exclusion: 1. Use of medications for psychiatric disorders during time of research 2. Being off work/unemployed 3. History of previous voice therapy 4. Males	Strategies which were reported more by group 1-Frequency and significance Item 2: "I try to avoid situations where my voice problem would become evident"- G1-26 (86.7%), G2-17 (56.7%), G3-10 (33.3%), p=0.010 Item 4: "I try to find as much information as possible about my voice problem"-G1-28 (93.3%), G2-20 (66.7%), G3-6 (20%), p=0.010 Item 5: "I find it easier to cope with my voice problem by expressing my feelings outwardly"- G1-26 (86.7%), G2-18 (60%), G3-8 (26.7%), p=0.020 Item 13: "I find it easier to cope with my voice problem if I ask the doctor questions about it"- G1-28 (93.3%), G2-19 (63.3%), G3-4 (13.3%), p=0.005 Reported more by G2 Item 22: "I ignore my voice problem by only looking at the good things in life"- G1-9 (30%), G2-18 (60%), G3-5 (16.7%), p=0.020	1. Strategies used by teachers with vocal complaints are more problem focused. 2. No correlation observed between VDCQ scores and treatment seeking behavior

VAS, Visual Analog Scale; VHI, Voice Handicap Index; PAL, Palliative Reactions; AV-W, Avoidance and Waiting; PAS, Passive Reaction; EXP, Expression of emotion; ACT, Active tackling; SOC, Seeking social support; REAS, Reassuring thoughts; VAPP, Voice Activity and Participation Profile.

TABLE 6.
Combined Frequencies of 10 VDCQ Items With Highest Scores Reported by Zambon et al (2014) and Ferraciu et al (2015)
and Classification of Items into Relevant Subscales of the Original Validated Version of the VDCQ (Epstein et al, 2007)

Q no:	Question	Yes (n%)	Category	Info Seeking	Social Support	Passive Coping	Avoidance
8	I find it easier to cope with my voice problem by finding out as much about it as I can	87%	Problem	✓			
13	I find it easier to cope with my voice problem if I ask the doctor questions about it	82%	Problem		✓		
24*	Resting my voice at times, helps me cope with my voice problem	82%	Problem				
3	I find myself wishing that I never had a voice problem	80%	Emotion			✓	
1	It helps me to cope with my voice problem if other people are sympathetic	79%	Emotion		✓		
4	I try to find as much information as possible about my voice problem	79%	Problem	✓			
15	I find it easier to cope with my voice problem by wishing that it would go away or somehow be over with	77%	Emotion			✓	
2	I try to avoid situations where my voice problem would become evident	75%	Problem				✓
5	I find it easier to cope with my voice problem by expressing my feelings outwardly	75%	Emotion		✓		
7	I find talking with friends and family about my voice problem helpful	72%	Problem		✓		

* Question 24 is not a part of the original VDCQ items; therefore, the subscale could not be determined.

differences in methodology, particularly the definition and measurement of coping, the outcomes of this study could not be synthesized with the other studies of this review and are presented separately.

Factors associated with coping in professional voice users

None of the studies aimed to investigate factors affecting coping; however, results from three studies^{14,19,20} which used the Voice Handicap Index and the UCL suggested that perception of vocal handicap influenced coping styles, leading to significant differences in UCL subscale scores between groups with high and low vocal impairment. Details pertaining to these differences can be found in Table 5.

Meulenbroek et al (2010b)²⁰ reported that student teachers in training showed a more passive style of coping at the end of their training period suggesting that trainee experience could potentially influence coping.

DISCUSSION

The purpose of this review was to investigate how professional voice users cope with voice problems. It also aimed to evaluate how coping was assessed and identify factors associated with coping in professional voice users.

Coping with voice problems in professional voice users was explored in this review. Seven studies fulfilled the inclusion criteria and were included in the review. We found that teachers used both active/problem focused and passive/emotion focused coping styles with a slight inclination towards the former. While studies using the UCL reported a more passive coping style and lesser active coping in teachers with higher vocal handicap, studies using the VDCQ reported that social support was used the most in teachers with voice problems and avoidance, the least. Seeking social support was highlighted as a frequently used coping strategy across studies and measures. In terms of factors affecting coping, vocal handicap was an influencing factor; and in student teachers, trainee periods seemed to affect coping.

An issue in this review was that though all professional voice users were included in the search strategy, all studies found were undertaken with teachers. This could be because teachers are a common profession with high voice use and at a higher risk for developing a voice disorder and has therefore received more research attention. Additionally, teachers may also be easier to recruit since considerable numbers of participants can be recruited from a single source (e.g., schools, universities).

The evidence base was highly focused on female voice users with five of the seven studies recruiting only females. The justifications provided for recruiting only females were higher incidence of voice problems in women²⁰ and that the majority of the teaching population were women.²¹ However, it can be argued that focusing on only one gender does not allow the testing or verification of whether males and females use different coping strategies. It is, therefore, imperative to study both genders to verify if females and males use different coping strategies in future studies.

In terms of the quality of the included studies, limited information was provided regarding the participants and setting in six out of seven studies. This posed difficulties in making comparisons across studies particularly to identify factors which may be associated with coping. Only one study was of good methodological quality.²³ The two Brazilian studies^{21,22} scored the lowest among all the studies included in the review. This was due to methodological flaws in the use of VDCQ and reporting of results where both studies described the frequency of use of coping strategies using a presence/absence paradigm rather than using the 6-point Likert scale of the VDCQ, thereby reducing specificity and variance of the collected information.

The review summarized the measures used to assess coping in teachers. The tools used for self-assessment of coping were UCL and VDCQ. Though there is overlap between subscales of the two measures (e.g; social support, passive coping), subscales of UCL are constructed on the premise that individuals tend to use fairly similar coping strategies across a wide variety of situations. Therefore, UCL conceptualizes coping as a trait or disposition and essentially measures coping styles and describes the consistent ways in which individuals cope with stress providing validity across different situations.²⁶ This was reflected in the present review where the measure was used consistently and reliably across all studies (n=4) and yielded similar results. This stability also enables the use of one set of normative data developed by the authors²⁴ for comparison with different populations across studies. However, measurement of coping as a dispositional style does not account for the inevitable variability in coping behavior induced by the context, thereby oversimplifying the coping process.²⁶ Moreover, UCL is a generic coping questionnaire which is not disease specific and is therefore not specifically designed to measure voice-related coping. It could be argued that the lack of context-specificity of UCL could potentially overlook the dynamism of a voice problem across situations and across time. Secondly, the full version of UCL is long with 47 questions

and could be wearisome and tiring for patients, thereby leading to information loss if not completed in full or properly due to response fatigue.

In comparison to UCL, VDCQ is a disease specific-measure which allows clinicians to evaluate voice-related coping, in a relatively shorter format. The VDCQ measures coping as a state rather than a trait, which means it assumes coping to be a process which is linked to the situation (such as vocal problems, and the specific stage or time within the course of the illness trajectory) rather than a personality characteristic which is relatively stable across situations.

Only two studies^{21,22} in the review used VDCQ to assess coping in teachers and there were issues with scoring. The original 15-item VDCQ compares the individual mean item scores of the four subscales to generate coping profiles. However, both studies in the review used an earlier 27-item version of VDCQ and adopted a binary subclassification namely problem focused and emotion focused strategies. Additionally, both studies reported results based on the total VDCQ scores which only shows the levels of overall coping rather than identifying patterns across subscales and does not provide a meaningful measure e.g., a higher total VDCQ score does not indicate effective coping. Therefore, these results were not included in the review and only the absolute values of individual items provided by both studies were considered for analysis. This, however, poses an inherent lack of clarity in the interpretation of VDCQ which is supported by the results of a systematic review conducted by Francis *et al* (2017)²⁷ on patient-reported outcome measures for voice. They reported that the VDCQ does not describe the proposed scoring approach or algorithm which would assist in interpretation.

Results of UCL and VDCQ revealed that teachers in general have an inclination to seek support from their peers, friends and family. Evidence²⁸ suggests that women are more likely to seek social support to deal with problems which may explain this finding since most of the participants in the present review were women. Van-Wijck Warmaar (2010)¹⁴ suggests that a passive coping response indicates a defensive approach, where teachers demonstrate an inclination to use situation oriented or emotion focused strategies. They indicated that the combination of social support and passive coping strategies is maladaptive and can be detrimental to effective problem solving and lead to reduced self-esteem and self-confidence. Passive coping is also linked to the development of psychological and physical symptoms and active-problem solving coping to increased well-being and overall health outcomes.⁹ To illustrate this point further, let us consider a singer who has developed hoarseness of voice. They may take control and seek medical help to know more about the problem which is likely to culminate in a positive outcome. Alternatively, they may undertake a passive approach and continue performing, hoping that the voice problem would resolve on its own, thereby creating a situation where a more serious and permanent vocal damage is possible. Even though the pattern of results from research suggests that passive coping correlate with better

outcomes, Austenfield and Stanton (2004)²⁹ refuted this view after performing a systematic review which examined this relationship. They concluded that it was unfeasible to collectively report findings on the association between active and passive coping styles and physical and psychological symptoms due to the vast differences in coping strategies included in the assessment tools and how these strategies were operationally defined. Therefore, implications regarding coping purely based on the active/passive paradigm should be interpreted with caution and clinicians should provide guidance on adaptive coping based on a multifaceted approach, considering specific coping styles or strategies and context requirements, including the stage of illness. Epstein et al (2009)¹⁰ suggested that individuals with 'chronic' conditions, which require coping with the voice problem over a lengthy period of time, such as Spasmodic Dysphonia, are likely to use avoidance and passive coping because they feel there is little they can do about their voice problem. While this may be beneficial for the individual in the short term, especially in the early stages of the illness, long term use of these mechanisms could impact their quality of life. Therefore, the frequency of use of such strategies should be closely monitored throughout the illness, to avoid maladaptive behavior.

De Jong (2003)¹⁸ explored coping strategies in teachers with persisting voice problems by drawing parallels with the psychological cascade model described by Anderson (cited in De Jong et al, 2003). The study suggested that the majority of the teachers were stuck in phase 1 of the psychological cascade model due to a combination of externalization and unawareness, along with the severity of the voice problem. These factors hindered progressing to phase 2 and 3 which is characterized by acceptance of the disorder and hope finally leading to recovery. Therefore, this study highlights the temporal nature of the process of coping and its evolving trajectory across situations and reiterates the need to take context of the condition into account while taking clinical decisions.

Rong et al (2017)³⁰ explored the factors affecting adoption of coping strategies while dealing with illness and reported that ethnicity, religion, disease duration, symptom management and various sociodemographic factors influenced coping. Current research in professional voice users does not sufficiently specify these parameters to allow comparisons and synthesis.

Limitations and strength of evidence

A vast amount of heterogeneity was noticed in the results and methodologies adopted to measure outcomes related to coping. The primary reason is the diversity of definitions used to describe coping and lack of a consistent conceptual framework to study coping. More specifically, coping in the context of voice disorders has not received much attention, particularly pertaining to professional voice users.

As indicated above, only studies involving teachers were identified and included in the review. This limits the

generalizability of the findings to other professional voice users. Moreover, the quality of included studies was fair.

Despite these limitations, an extensive search was carried out to identify articles for this review. The search was implemented across 10 databases using both EBSCO and Ovid platforms. Additionally, grey literature was also searched, and reference tracing undertaken. These improve the strength of the present review in terms of comprehensiveness of the search results. This review is the first of its kind to examine voice related coping in professional voice users and provides a comprehensive analysis of research evidence in the area.

CONCLUSION AND FUTURE DIRECTIONS

Results of the systematic review identified significant gaps in the evidence base, pertaining to methodological strength and population groups. Firstly, only one study was found to be of good methodological quality which recognizes the need for well-developed studies with clear and reliable reporting of results. Secondly, this review identified that only teachers have been studied in the context of coping. More research is warranted involving other professional voice users such as singers to determine if similar mechanisms and resolutions apply. Similarly, a greater balance in examination of genders to identify if they use different strategies is recommended.

Models and frameworks that research coping (transactional model etc.) can account for context and changes over time. Using models, frameworks and qualitative methodologies will provide in-depth understanding of coping processes. Current research does not sufficiently specify factors affecting coping to allow comparisons and synthesis. Examining the influence of constructs such as impact of voice problems, measured using standardized tools such as the Voice Handicap Index,³¹ Voice Activity Participation Profile³² etc. on coping would widen the understanding of factors affecting coping and is a potential area for further research.

DECLARATION OF INTERESTS

None.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at [doi:10.1016/j.jvoice.2022.08.024](https://doi.org/10.1016/j.jvoice.2022.08.024).

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