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Review articles

Mapping the evidence available in the scientific literature regarding the impact of individual, environmental and organizational factors on teachers' vocal illness: A scope review protocol

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ABSTRACT

Purpose: to map and characterize the evidence available in scientific literature regarding the impact of individual, environmental and organizational factors on teaching vocal illness.

Methods: a scoping review protocol following the guidelines of the Joanna Briggs Institute Reviewer's Manual and the PRISMA ScR Checklist. The following question was elaborated: What evidence is available in the scientific literature regarding the impact of individual, environmental and organizational factors on teaching vocal illness? A search will be carried out in the databases LILACS (BVS), MEDLINE (PUBMED), Embase (Elsevier), Cochrane (Clinical Trials only), Speechbite, Scopus (Elsevier) and Web of Science. The search strategy will be developed for MEDLINE (PUBMED) and adapted for other databases. Studies carried out with teachers of any level of education, age group and gender, with complaints related to voice and which addressed the impact of teaching work on vocal illness will be included. The selection of studies will be carried out by two independent and blinded reviewers. The results will be presented through graphs, charts and tables.

Final Considerations: the protocol can highlight gaps, understand the research methodologies used by the studies to be included, making it possible to carry out primary studies that allow for better evidence regarding the relationship between organization, work environment and teaching.

Keywords: Faculty; Dysphonia; Voice Disorders; Occupational Health; Voice

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INTRODUCTION

Teachers are voice professionals who present potential risk factors for developing a Work-Related Voice Disorder (WRVD), standing out among other professionals, due to the multifactorial nature of their work context[1]. A study comparing the incidence of vocal disorders between teachers and non-teachers concluded that teachers show a higher prevalence of vocal health issues. In the aforementioned study, conducted with 3,265 participants, 63.3% of teachers reported experiencing vocal changes at some point in their careers, compared to 35.8% among non-teachers[2]. Furthermore, this research indicated that Brazilian teachers exhibited a greater number of vocal symptoms as compared to non-teachers, averaging 3.7 symptoms in teachers compared to 1.7 in non-teachers.

Data from another study, conducted with 317 primary and secondary school teachers in the state public network in the city of Cuiabá, MT, Brazil, revealed that 81% of the sample presented dysphonia[3]. Additionally, international research demonstrates a similar situation and highlights the consequences of voice problems on teaching performance, underscoring the need for care and attention for this group[4-6].

WRVD can be defined as a work-related vocal alteration that impacts the performance of the worker's tasks and the transmission of information in their daily routine, with or without the presence of laryngeal pathology, and typically exhibiting slow and progressive development. Its onset is associated with the work process, encompassing environmental and organizational aspects, as well as individual predisposing factors[7].

Given this context, it is crucial to deepen research focused on vocal health issues among teachers. Understanding the work environment and practices of these professionals enables a focus on the relationship between environment, work, and voice, allowing for interventions that may help to minimise WRVD.

Various factors can contribute to the onset of WRVD, including high levels of ambient noise, cleanliness of the location, acoustics, ventilation, lighting, temperature, and inadequate furniture and equipment[3]. Additionally, the school environment often displays unsatisfactory work organization, with an excessive number of students, accumulation of tasks or roles, prolonged working hours, lack of rest periods, and weak oversight from education departments or teachers' unions[3,8]. There are also predisposing factors, such as allergies, respiratory tract infections, age, gender, and general health issues, which may affect vocal production and quality[3,8,9].

These factors lead to various consequences for the physical and mental health of the teacher, potentially triggering or worsening a vocal disorder. Consequently, a teacher with vocal health issues will experience compromised performance in their work activities, along with a reduction in activities, absenteeism (often of short duration) associated with other comorbidities, or even permanent functional leave, with social, professional, economic, and personal implications[3,10].

In a study on teacher absenteeism, it was observed that the main reasons for their absence from work included health problems, emotional issues (22%), respiratory problems (17%), and professional undervaluation (9%). Vocal problems and work overload accounted for 26% of the causes identified in the research[11]. In another study, 246 health-related work leave occurrences were recorded during the study period, in a sample consisting of 116 teachers[12].

The pursuit of understanding the relationship between work and vocal health issues has been ongoing in Speech Therapy over the years. In the literature, there is a range of publications[9] that discuss the development of vocal disorders increasingly associated with the work process of educators, resulting in various health consequences as well as functional incapacity to perform work activities.

There are studies with various designs aimed at investigating vocal health issues among teachers, including systematic, integrative, and scoping reviews. Through a preliminary search in LILACS (via BVS) and MEDLINE (via PUBMED), two similar studies were identified: an integrative[8] review and a systematic review, respectively[13].

Despite these other reviews having been conducted, the present research aims to provide a broader reach and deeper understanding of the topic, updating and complementing previous findings to foster greater reflection on the subject and, if possible, contribute to the development of public policies aimed at promoting, preventing, and rehabilitating teachers' vocal health.

The relevance of this scoping review lies in the fact that it follows a guideline with systematic steps that ensure methodological clarity. It explores gaps in the proposed topic and potentially broadens the discussion by including studies with various designs. Thus, comprehensive mapping will be done through a transparent, rigorous, and reproducible method. In this sense, the scoping review can examine how research

is conducted in a particular area of knowledge and identify emerging evidence[14].

The present review aims to map and characterize the available scientific literature on the impact of individual, environmental, and organizational factors on vocal health issues among teachers.

METHODS

It consists of a scope review protocol developed in accordance with the guidelines of the Joanna Briggs Institute Reviewer's Manual[15] (JBI) and the recommendations contained in the PRISMA ScR[16] checklist. Following the methodological recommendations, the following research question was formulated (adhering to the PCC acronym, respectively, population, concept, and context): What evidence is available in the scientific literature regarding the impact of individual, environmental, and organizational factors on vocal health issues among educators? This protocol is registered with the Open Science Framework (OSF) under the number: OSF.IO/R4C6X.

Eligibility Criteria

The eligibility criteria adopted will adhere to the PCC acronym (Chart 1), wherein the participants (P) will be teachers who present voice-related complaints, from any level of education, that is, Early Childhood Education, Primary Education, Secondary Education, or Higher Education, including Youth and Adult Education (EJA, *Educação de Jovens e Adultos*, in Portuguese), regardless of age and gender, and irrespective of the duration of their service in either the public or private sector. The concept (C) will encompass the impact of work on vocal health issues among educators, in the context (C) of Basic Education, EJA, and Higher Education, whether public or private. Peer-reviewed scientific articles published in national and international journals will be included, as well as grey literature, with studies being either observational or interventional, without restrictions on language or year of publication. Studies addressing vocal health issues without correlation to teaching work, those not conducted exclusively with participants from the teaching category, abstracts from scientific events, and narrative, systematic, and integrative reviews will be excluded.

Chart 1. Study eligibility

	Inclusion criteria
Population	Teachers who present complaints related to their voice, at any level of education (Early Childhood Education, Elementary, Secondary or Higher Education, as well as Youth and Adult Education - EJA), in any age group and gender, regardless of the length of experience and service (public or private).
Concept	Negative impact of work on vocal illness in teachers.
Context	Context of basic education, EJA and higher education, public or private
Types of Evidence Sources	Scientific articles on experimental, quasi-experimental, observational, analytical or descriptive studies, with a quantitative, qualitative or mixed approach, with no limits on language or year of publication will be included.

Search Strategy and Information Sources

Initially, a preliminary search was conducted in LILACS (via BVS) and MEDLINE (via PubMed) to identify and analyse potential keywords found in the titles and abstracts of the articles selected from these databases. The identified keywords were used as search terms and were added to the descriptors from DeCS and MeSH. Subsequently, an expanded search will be conducted across the MEDLINE (via PubMed), Embase (via Elsevier), CENTRAL (via Cochrane Library), Speechbite, Scopus (via Elsevier), and Web of Science databases, considering the following descriptors: "teacher," "occupational diseases," "dysphonia," "voice," "voice quality," "voice disorders," "working conditions," "occupational stress," "occupational risks," "worker health," along with their corresponding MeSH terms: "School Teachers," "Faculty," "Dysphonia," "Voice," "Voice Quality," "Voice Disorders," "Hoarseness," "Occupational Health," "Occupational Stress," "Occupational Diseases," "Workplace," and "Occupational Injuries." For the search of grey literature, the OpenGrey and Google Scholar databases will be utilised; for the latter, the first 100 records returned through the search strategy will be considered.

The search strategy developed for MEDLINE (via PubMed) will be used as a reference for translation to the other databases. Finally, a review of the reference lists of the studies included in the review will be conducted. When a study is deemed eligible but does not present complete or necessary data for extraction, contact will be made via email with the corresponding author of the study for further clarification. If the contacted author does not respond to the email within 10 days from the date of sending, the article will be excluded due to incomplete data. In Chart 2, the search strategy developed for the MEDLINE (via PubMed) database is presented, which will be adapted for the other databases.

Chart 2. Search strategy - MEDLINE via PUBMED (search conducted in April 2023)

Search	Strategy	Recovered records
#1	"School Teachers"[Mesh] OR (School Teacher) OR (Teacher, School) OR (Teachers, School) OR (High School Teachers) OR (High School Teacher) OR (School Teacher, High) OR (School Teachers, High) OR (Teacher, High School) OR (Teachers, High School) OR (Middle School Teachers) OR (Middle School Teacher) OR (School Teacher, Middle) OR (School Teachers, Middle) OR (Teacher, Middle School) OR (Teachers, Middle School) OR (Elementary School Teachers) OR (Elementary School Teacher) OR (School Teacher, Elementary) OR (School Teachers, Elementary) OR (Teacher, Elementary School) OR (Teachers, Elementary School) OR (Pre-School Teachers) OR (Pre School Teachers) OR (Pre-School Teacher) OR (Teacher, Pre-School) OR (Teachers, Pre-School)	34.844
#2	"Faculty"[Mesh] OR (University Professor) OR (Professor, University) OR (Professors, University) OR (University Professors)	2.003.395
#3	#1 OR #2	2,029,728
#4	"Dysphonia"[Mesh] OR (Phonation Disorders) OR (Phonation Disorder) OR (Hyperkinetic Dysphonia) OR (Dysphonia, Hyperkinetic)	19.593
#5	"Voice"[Mesh]	15.335
#6	"Voice Quality"[Mesh] OR (Qualities, Voice) OR (Quality, Voice) OR (Voice Qualities)	13.279
#7	"Voice Disorders"[Mesh] OR (Voice Disorder) OR (Voice Disturbance) OR (Disturbance, Voice) OR (Disturbances, Voice) OR (Voice Disturbances) OR (Voice Fatigue) OR (Fatigue, Voice) OR (Fatigues, Voice) OR (Voice Fatigues)	18.079
#8	"Hoarseness"[Mesh] OR (Hoarsenesses) OR (Hoarseness of Voice) OR (Voice Hoarseness) OR (Hoarseness, Voice)	7.937
#9	#4 OR #5 OR #6 OR #7 OR #8	38.013
#10	"Occupational Health"[Mesh] OR (Health, Occupational) OR (Industrial Hygiene) OR (Hygiene, Industrial) OR (Industrial Health) OR (Health, Industrial) OR (Safety, Occupational) OR (Occupational Safety) OR (Employee Health) OR (Health, Employee)	338.670
#11	"Occupational Stress"[Mesh] OR (Occupational Stresses) OR (Stress, Occupational) OR (Stresses, Occupational) OR (Job Stress) OR (Job Stresses) OR (Stress, Job) OR (Stresses, Job) OR (Work-related Stress) OR (Stress, Work-related) OR (Stresses, Workrelated) OR (Work related Stress) OR (Work-related Stresses) OR (Workplace Stress) OR (Stress, Workplace) OR (Stresses, Workplace) OR (Workplace Stresses) OR (Work Place Stress) OR (Stress, Work Place) OR (Stresses, Work Place) OR (Work Place Stresses) OR (Professional Stress) OR (Professional Stresses) OR (Stress, Professional) OR (Stresses, Professional) OR (Job-related Stress) OR (Job related Stress) OR (Job-related Stresses) OR (Stress, Job-related) OR (Stresses, Job-related) OR (Workplace Bullying) OR (Bullying, Workplace) OR (Workplace Abuse) OR (Abuse, Workplace) OR (Abuses, Workplace) OR (Workplace Abuses)	86.814
#12	"Occupational Diseases"[Mesh] OR (Disease, Occupational) OR (Occupational Disease) OR (Occupational Illnesses) OR (Illnesse, Occupational) OR (Illnesses, Occupational) OR (Occupational Illnesse) OR (Diseases, Occupational)	209.066
#13	"Workplace"[Mesh]	29.193
#14	"Occupational Injuries"[Mesh] OR (Injuries, Occupational) OR (Injury, Occupational) OR (Occupational Injury)	38.880
#15	#10 OR #11 OR #12 OR #13 OR #14	510.917
#16	#3 AND #9	2.999
#17	#15 AND #16	389
#18	(casereports[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR controlledclinicaltrial[Filter] OR clinicaltrialprotocol[Filter] OR comparativestudy [filter] OR muticenterstudy [Filter] OR observationalstudy[Filter] OR randomizedcontrolledtrial[Filter])	Filter
#19	#17 AND#18	67

Source: Authors

Study Selection

The records retrieved through the electronic search will be imported into Rayyan, a web-based platform that will be used for study selection, where duplicate articles will be removed. The selection of studies will be conducted in two stages by two independent reviewers, with any conflicts at each stage resolved by consensus. If the consensus meeting is insufficient to resolve the disagreements between the two reviewers, a third reviewer will be consulted to arbitrate, preferably one with greater expertise on the topic.

In the first stage, the reviewers will perform a screening based on the reading of titles and abstracts. In the second stage, a full-text reading of the eligible studies resulting from the previous stage will be conducted. The justifications for the exclusion of articles following the full-text reading will be presented in the results section of the scope review article.

Data Extraction

Data from the eligible studies will be extracted by two independent reviewers using a data extraction tool developed by the reviewers for this study (Chart 3). This form will include information regarding the population, concept, and context, as well as the study design, objectives, location, topics addressed, environmental and organizational factors associated with vocal complaints, individual factors related to vocal complaints, and main conclusions. A pilot test, using five included studies, will be conducted to calibrate the data extraction form developed for this review. Upon completion of this stage, adjustments to the form will be made, if necessary, to facilitate data extraction. Following calibration, data extraction will proceed, with any conflicts resolved by consensus; if required, a third reviewer will arbitrate. This entire process will be detailed during the writing of the proposed review article.

Data Analysis and Presentation

The extracted data will be presented through tables, figures, and graphs, aligned with the objectives and questions of this scope review. The graphs will depict the distribution of studies by year, production distribution by journals, locations of the research conducted, and types of studies. Descriptive statistics, including absolute and relative frequencies, will be considered to describe and characterize variables, such as environmental and organizational factors associated with vocal complaints. The charts will provide a summary of the studies by author (year) and country of publication, the objective of the article, sample size, and factors associated with vocal alterations.

The results will be accompanied by a narrative summary containing the most relevant information regarding the selected studies, and, where possible, the included studies will be grouped into thematic categories for descriptive analysis based on the content analysis technique proposed by Bardin[17].

Chart 3. Form for extracting data from selected articles

First Author's Surname:					
Title					
Journal		Year		State/Region:	
Volume		Number		Pages	
Study Characteristics Eligibility					
Population					
Concept					
Context					
Study design					
Characterization of studies					
Purpose of the study					
Level of education					
Sample (number of participants, groups, gender and average age)					
Measurement of outcomes					
Environmental and work organization factors associated with vocal complaints					
Individual factors associated with vocal complaints					
Procedures					
Conclusions					

Source: Authors

DISCUSSION

Voice is the most important tool in an individual's communication. However, there is a category of professionals who stand out due to the excessive use of their voice in their work activities. This group consists of teachers who use their voice as an essential working instrument, often under unfavourable conditions, making them more susceptible to vocal problems[18].

Intensive use of the voice, coupled with factors arising from the environment, individual aspects, and work organization, can contribute to the onset and/or emergence of vocal disorders in educators. Regardless of the factors causing this vocal issue, the initial symptom of unhealthy vocal production is the presence of one or more symptoms of discomfort in the vocal tract, likely resulting from excessive strain during phonation[19,20].

In order to better understand the relationship between work and illness, a classification has been organised in which a worker's illness arises from the performance of their work activities to varying degrees, namely: "I) single cause; II) contributory factor for the establishment of the illness; or III) exacerbating factor for a pre-existing condition." This categorisation serves as an important tool in confirming cases where work activities negatively impact health, leading to illness[21]. It is worth noting that vocal disorders (WRVD) fall into groups II and III due to their multifactorial nature[1].

In the case of the relationship between work and voice, the multiple affective, psychosocial, and organizational aspects present in the work environment associated with the development of vocal disorders suggest that teachers' vocal health should be addressed as something beyond merely a health problem at work that blames the worker[22]. Thus, it is necessary to understand this illness beyond the binary of improper use/voice abuse, refraining from holding the teacher responsible for not knowing how to use their voice properly[23]. Vocal disorders and inappropriate vocal use are the result of the precarious working conditions to which teachers are exposed in the performance of their work activities[23].

The literature indicates that the teaching profession is at high risk for vocal disorders and is the most researched category within the field of Speech-Language Pathology regarding voice[24]. This underscores the importance of gaining a deeper understanding of this category of workers and the characteristics of their voices. In a recent study[25], a scoping review was conducted to map the characteristics of studies

addressing the topic of teachers' voices in national Speech-Language Pathology journals, resulting in a classification of 11 thematic categories identified by the authors of the study. The most frequently researched categories included: studies on the correlation/association of vocal findings, vocal self-perception, intervention effects, surveys of vocal symptomatology, as well as the association between symptoms, self-perception, and the work environment[24].

It is worth noting that the strength of disseminating this scope review protocol lies in publicising a clear and reproducible procedure, as well as updating the scientific evidence regarding the impact of individual, environmental, and organizational factors on vocal health issues among educators. Furthermore, it provides an opportunity for reflection on future proposals for well-designed methodological studies that address these issues in the long term, moving beyond mere descriptions of the determinants affecting teachers' health.

Consequently, these new studies may transform the reality of these educators by implementing measures that foster a healthy working environment and an organizational structure that meets teachers' needs, alongside public policies aimed at supporting this workforce. Thus, as important as identifying the causes and impacts of individual, environmental, and organizational factors on vocal health issues is the need to reconsider and reflect on ways to minimise vocal risks, broadening the discussion with education to encourage reflections on teaching activities.

FINAL CONSIDERATIONS

The vocal health of teachers has increasingly garnered academic interest due to vocal health issues among educators, which can result in detriments both professionally and personally. The proposed scope review protocol, through mapping the impact of individual, environmental, and organizational factors on teachers' vocal health issues, aims to enhance understanding of these factors and how they can affect the professional activities of the teaching category. Through the proposed review, gaps can be identified, and the investigation methodologies employed in the studies to be included can be comprehended, to propose primary studies that provide better evidence regarding the relationship between organization, work environment, and teaching. This seeks to offer a broader perspective on the relationship between health, illness, and work, which may help reduce social inequalities concerning the precarious working conditions in Brazilian schools. Furthermore, it may contribute to expanding the discussion for the development of strategies and actions at various levels, fostering integration between health and education managers to mitigate the risk factors affecting teachers' vocal health, thereby creating a healthy working environment that allows for effective teaching without compromising the health and quality of life of these professionals.

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VFAP: Conceptualization; Formal analysis; Methodology; Writing - Original draft.

EPGM: Methodology; Writing - Review and editing.

JFS, CB: Writing - Review and editing.

Data sharing statement:

Future research data (selected articles) will be shared through the database created by the authors for a period of six months.