Interventions that target or affect voice or speech production during public speaking: A scoping review protocol

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ABSTRACT

Background: Public speaking is frequently necessary in many professional and educational settings, as well as in personal contexts (e.g., at a family party or wedding). Mastering this communication skill is particularly important in today's society. But public speaking is one of people's most feared activities. The anxiety generated by this situation has consequences for communication performance, especially voice characteristics and speech fluency. Training techniques for public speaking have been described in the literature.

Objective: The purpose of this scoping review is to map and examine the available evidence of public speaking interventions that target or affect voice or speech.

Eligibility criteria: All peer-reviewed interventional studies with pre and post (quantitative or qualitative) measures on voice or speech will be included. Only English- and French-language studies, published from 2000 to the present, will be included. This scoping review will consider participants of all ages (child and adult) with and without disorders. The core concept examined is interventions that target or affect voice or speech during public speaking.

Methods: An extensive literature search will be conducted in three bibliographic databases: Medline ALL/Ovid, PsycINFO/Ovid and Eric/Ovid. The reference lists of all articles included in the review and of all reviews identified in the three databases will be hand-searched for additional relevant papers. All identified records will be uploaded into Covidence and assessed by two independent reviewers. Key data extracted from the selected articles will include details about the JBI PCC mnemonic (Population, Concept and Context), relevant information about source characteristics and any information relevant to the search questions.

INTRODUCTION

Rationale

Public speaking is an essential activity frequently used to defend an opinion, convey an idea, convince others, or succeed in a job interview or at school (Wörtwein et al., 2015). These situations depend on the speaker's competence at conveying to the listener in a certain context (Haber & Lingard, 2001), namely in front of an audience. Public speaking is necessary in many professions and is even one of the core competencies for certain professionals such as teachers, trainers, lecturers, politicians and managers (van Ginkel et al., 2015; Wörtwein et al., 2015). As a matter of fact, one of the skills these professionals must acquire is effective public speaking because it can have an impact on their career success, reputation and credibility (Ferreira Marinho et al., 2017). This competence is also important for graduates of higher education institutions to acquire (van Ginkel et al., 2015). This emphasis is evident in the Dublin Descriptors (i.e., the Qualifications Framework of the European Higher Education Area), in which one of the five higher education qualifications refers to communication (Joint Quality

Initiative, 2004, cited by Van Ginkel et al., 2015). In addition, 78.8% of employers consider oral communication skills to be among the five most important skills of recent college graduates (Montes et al., 2019). However, many graduates, as well as students and professionals, lack oral presentation competence defined as "the combination of knowledge, skills, and attitudes needed to speak in public in order to inform, self-express, to relate and to persuade" (De Grez et al., 2009). In school and work contexts, competent speakers are more successful at conveying their knowledge, ideas, and opinions (Herbein et al., 2018). A lack of competence can therefore have negative consequences for speakers.

Although public speaking is a widespread activity, a large proportion of the population does not feel comfortable speaking in public. This is true of the general population (typical individuals) (Ferreira Marinho et al., 2017) as well as of individuals with speech disorders (e.g., stuttering) (Iverach et al., 2011), voice disorders (e.g., dysphonia) (Ofer & Reut, 2013) or anxiety disorders (e.g., social anxiety) (Ebrahimi et al., 2019; Heeren et al., 2013), particularly because of the fear it generates in speakers of being evaluated negatively by others. This communication apprehension can be defined as a person's level of anxiety associated with anticipated or actual communication with other people (McCroskey, 1977). In the voice literature, it refers to performance anxiety (also called stage fright, Studer et al., 2011), defined as "anxiety while being observed or scrutinized by others" (Heimberg et al., 1999, p. 209, cited by Hook et al., 2013) in performance situations (e.g., taking an oral exam). Since everyone has to speak in public at some time, no exclusion criteria for the population were defined in this scoping review. Effectively, its objective is to identify all interventions that target or affect voice or speech in public speaking for the entire population (child and adult, pathological and non-pathological).

The apprehension linked to public speaking objectively impacts oral communication, particularly voice and speech (Buchanan et al., 2014; Laukka et al., 2008), two key concepts for this scoping review. Voice is the sound produced by vocal fold vibration and involves different processes such as breathing, phonation, articulation and resonance. Frequency, sound pressure level, harmonic content and temporal aspects are used to characterize voice. The literature highlights the impact of anxiety on voice production, for example increasing the fundamental frequency or decreasing its variation (reduced intonation) (Van Puyvelde et al., 2018). As a result, an anxious voice can be higher-pitched, softer, monotonous or shaky. Speech, defined as human articulated language, can also be affected by anxiety. For example, there is an increase in disfluencies (interruptions in the flow of speech), specifically a higher number of interjections (e.g., "uh") and silent pauses (Goberman et al., 2011; Metz & James, 2019), as well as an increase in the duration of pauses when the anxiety level increases (Buchanan et al., 2014). Accordingly, anxious speech is less fluent.

Because public speaking is one of the most commonly feared situations reported in the population, with prevalence estimates ranging from 20% to 34% among adults (Botella et al., 2010), different interventions have been described in the literature. Most of them target anxiety without analyzing voice and speech. For example, the meta-analysis by Ebrahimi et al. (2019) demonstrated the effectiveness of psychological interventions (e.g., cognitive-behavioral therapy combining exposure and cognitive therapies) for participants with public speaking anxiety disorders, without focusing on voice and speech modifications.

Yet there are public speaking interventions that focus on voice and speech. For example, research findings suggest that awareness training is effective at reducing targeted speech disfluencies in public speaking (Montes et al., 2019), as is habit reversal (Bördlein & Sander, 2020; Pawlik & Perrin, 2019). The examination of the available evidence on public speaking

interventions is important to identify the scope of existing interventions and gaps in the current evidence. A scoping review is therefore relevant because it will map and qualitatively synthesize the evidence.

Objectives

This scoping review seeks to identify the study characteristics that target or affect voice or speech. This will provide professionals interested in public speaking (e.g., speech therapists, teachers, coaches, vocologists) with an overview of the characteristics of existing interventions.

Therefore, the research question is as follows: What is the extent and scope of the literature on interventions that target or affect voice or speech production in public speaking?

In addition, this review will focus on the following sub-questions: What are the content and delivery modalities of the interventions? Who is targeted by the interventions? What are the interventions' effects on voice or speech?

METHODS

Protocol and registration

This protocol and the corresponding future scoping review are reported using the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018). The proposed scoping review will be conducted in accordance with the Joanna Briggs Institute (JBI) methodology for scoping reviews (Peters et al., 2020). The scoping review protocol will be registered on the Open Science Framework (https://osf.io/) platform.

Eligibility criteria

All peer-reviewed intervention studies published from 2000 to the present with pre and post measures on voice or speech will be included. They may include randomized controlled trials, non-randomized controlled trials, before and after studies, and case studies. The date range limitation was justified by the fact that tools (e.g. softwares) for analyzing voice and speech have evolved and become more accurate. Only English- and French-language studies will be examined given that English is the language of science and French is the authors' native language.

The JBI PCC strategy was used to develop the following inclusion criteria regarding population, concept and context.

Population

This review will consider studies that include participants of all ages with and without disorders (e.g., stuttering, dysphonia, social anxiety). The participants per se are not a relevant inclusion criterion because the scoping review's purpose is to identify the study characteristics that target or affect voice or speech. For these reasons, all types of participants are included.

Concept

This scoping review will include studies that focus on interventions that target or affect voice or speech production assessed by quantitative (e.g., acoustic measurements, duration of silent pauses, frequencies of disfluencies) or qualitative measurements (e.g., self-assessments).

The aim of the studies included should be to improve public speaking. However, the delivery modalities of these interventions may or may not include public speaking in front of an audience (e.g., an individual intervention in front of an empty conference room).

Context

This review will consider literature about public speaking, which is any oral presentation made in front of an audience of more than one person (e.g., an oral presentation in front of a class, an audience, or a conference room).

Information sources

Three bibliographic databases were searched between November and December 2021 to identify relevant literature: Medline ALL/Ovid (1946–2022), PsycINFO/Ovid (1806–2022) and Eric/Ovid (1965–2022). The search strategies will be run one last time in March 2022.
The reference lists of all articles included in the review and of all reviews identified in the three databases will be hand-searched for additional relevant papers. The authors of studies or reviews will be contacted for further information, if this is relevant.

Search

An initial limited search of Medline ALL/Ovid and PsycINFO/Ovid was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for Medline ALL/Ovid (1946-2022), PsycINFO/Ovid (1806-2022) and Eric/Ovid (1965-2022) (see Appendix I). The search strategy, including all identified keywords and index terms, were performed with the help of an information specialist experienced in evidence synthesis (N. D.) and adapted for each databases. The search strategies focused on the three concept — public speaking, voice, and speech — and used a set of keywords and controlled terms. A limitation on publication years (from 2000 to the present) was added to the strategy. The reference lists of all articles included in the review and of all review identified in the three databases will be hand-searched for additional relevant papers.

Selection of sources of evidence

All identified records will be uploaded into Covidence (https://www.covidence.org/) and duplicates will be removed. Following a pilot test, the review process will be conducted in two stages. First, titles and abstracts will be screened by two independent reviewers (L. B. and P. M.) to determine their potential eligibility according to the inclusion criteria. Second, the full text of the selected papers will be retrieved and screened in detail according to the inclusion criteria by the same two independent reviewers. Reasons for excluding sources of evidence at the full-text reading stage will be recorded and reported in the scoping review. At both stages, discrepancies between the two reviewers' opinions during the selection process will be resolved by consulting additional reviewers (A. R. and A.-L. L.). Before beginning to select studies, the selection process will be tested using 10% of the identified articles to ensure that the reviewers agree on the inclusion criteria. The results of the search and study selection will be reported in full in the final scoping review and presented in a PRISMA-ScR flow diagram (Tricco et al., 2018).

Data charting process

Data will be extracted from papers included in the scoping review by two independent reviewers (L. B. and P. M.) using Covidence (https://www.covidence.org/) and following a data charting form developed by the two reviewers. The form will be modified and revised as necessary during the process of extracting data from each included evidence source, and modifications will be described in the scoping review publication. When the data from the first five articles have been extracted by the two reviewers, they will meet to ensure the consistency of their extraction.

Data items

Key data will be abstracted regarding study characteristics (e.g., author(s), year of publication), study design (e.g., randomized controlled trials, non-randomized controlled trials, before and after studies), aims/purpose of the study (e.g., improve public speaking skills), intervention content and delivery modalities (e.g., type of intervention, duration of each session), participant characteristics (e.g., sample size, age, gender, presence or absence of disorders), voice and speech measures (e.g., type, number and characteristics of measurements), primary outcome of the intervention (e.g., physiological measurements of anxiety levels), variables controlled (e.g., anxiety levels), key findings related to the review questions (e.g., effect on speech fluency), and study limitations.

Synthesis of results

The data will be presented in a summary table to identify, characterize and summarize research evidence on interventions that target or affect voice or speech production during public speaking. The table will contain different sections related to the type of studies, the population characteristics, the voice and speech measurements, and relevant findings about the intervention. The data will also be presented in a narrative summary relating the results to the review objective and questions. Any additional analyses that are added iteratively will be identified as such in the scoping review manuscript.

FUNDING

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APPENDICES

Appendix I: Search strategy on PsycINFO/Ovid

Database: APA PsycINFO <1806 to February Week 1 2022 >

Search Strategy conducted on February, 2022

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1   Public Speaking/ (1095)

2   (public* adj3 speak*).ti,ab,id. (1836)

3   1 or 2 (2247)

4   Voice/ (5156)

5   voice.ti,ab,id. (29191)

6   vocal.ti,ab,id. (14308)

7   phonat*.ti,ab,id. (1374)

8   Prosody/ (2818)

9   prosod*.ti,ab,id. (5024)

10   exp speech characteristics/ (13129)

11   speech.ti,ab,id. (82713)

12   articulat*.ti,ab,id. (35155)

13   Pronunciat*.ti,ab,id. (2601)

14   Verbal Fluency/ (5868)

15   fluen*.ti,ab,id. (23068)

16   dysfluen*.ti,ab,id. (505)

17   disfluen*.ti,ab,id. (1102)

18   4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 (170559)

19   3 and 18 (745)

20   limit 19 to yr="2000 -Current" (375)

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Table 1: Key data to be extracted

Key data to be extracted
1. Study characteristics (author(s), year of publication, design)
3. Aims/purpose of the study
4. Intervention content and delivery modalities (pre-intervention characteristics, audience characteristics during pre-intervention, type of intervention, audience characteristics during intervention, speech topic, speech duration, speech preparation time, speech preparation characteristics, session duration, number of sessions, total duration of the intervention, targets trained characteristics, trainer's profile, post-intervention characteristics, audience characteristics during post-intervention, generalization phase)
5. Participant characteristics (sample size, age, gender, disorder, mother tongue, number of participants who dropped out during the study, participants' professional situation)
6. Voice and speech measures (type of voice or speech measures analyzed, characteristics, number of measures, measuring tools, moments)
7. Primary outcome of the intervention
8. Variables controlled (e.g., anxiety levels)
9. Key findings related to the review questions
10. Study limitations