

Laryngeal Manual Therapies for Behavioral Dysphonia: A Systematic Review and Meta-analysis

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Summary: Objectives. The aim of this study was to review systematically the literature and to analyze the effectiveness of laryngeal manual therapy in addressing the overall severity of vocal deviation, the intensity of vocal and laryngeal symptoms, and musculoskeletal pain in adults with behavioral dysphonia.

Study Design. This is a systematic review and meta-analysis.

Methods. Two independent authors selected clinical trials that analyzed the effectiveness of laryngeal manual therapy compared with other interventions in the treatment of adults with behavioral dysphonia from the Cochrane Library, PubMed, Web of Science, and LILACS. The analyzed outcomes were the overall severity of vocal deviation, the intensity of vocal and laryngeal symptoms, and musculoskeletal pain. Data analysis was conducted based on the following steps: the assessment of the risk of bias, the measures of treatment effect and descriptive data analysis, the assessment of heterogeneity, subgroup analysis, sensitivity analysis, and the assessment of reporting biases.

Results. A total of 2135 studies were identified, three of which met the selection criteria. Data analysis showed an unclear risk of 100% of performance bias and 66% of detection bias, in addition to a 33% high risk of selection bias. Low statistical and clinical heterogeneities were found. In addition, no significant difference was found in the relative risk of improvement with laryngeal manual therapy and with other interventions in the analyzed outcomes.

Conclusions. Various types of laryngeal manual therapies are available with similar objectives and effects, but their effectiveness is equivalent to that of other interventions involving direct voice therapy in the rehabilitation of adults with behavioral dysphonia.

Key Words: Dysphonia–Therapeutics–Voice–Voice training–Voice disorders.

INTRODUCTION

The voice is considered to be adapted when it is produced and emitted without difficulty or effort. Any change in this process is called dysphonia.¹ The type of dysphonia that has as its etiology inappropriate vocal behavior, whether caused by vocal misuse or abuse, poor voice technique, or muscle tension, as predominantly related to the use of voice, is classified as behavioral dysphonia.^{1–3}

There are still a lot of contradictions in the literature about the definition and the clinical, vocal, and laryngeal manifestations of behavioral dysphonia, so the characteristics cited in the present study are based on the classification proposed by Behlau et al.¹ Thus, among the clinical manifestations of behavioral dysphonia can be an excessive muscle tension in the cervical, facial, and laryngeal muscles; an elevated larynx; a reduction of the thyrohyoid space; a hyperextended head; elevated shoulders; and an upper breathing pattern, among others.^{4–13} In addition, vocal characteristics can be found, such as vocal quality characterized predominantly by strain; a roughness and instability when associated with increased mass in the vocal folds, tension or stiffness in the vocal folds, and breathiness when associated with

an incomplete glottic closure; a hard vocal attack; poor articulation; and laryngeal or pharyngeal resonance.^{5,12–14}

As for the larynx, individuals with behavioral dysphonia may present a normal larynx in the presence of vocal deviations or a larynx with organic lesions, provided that the lesions are clear consequences of vocal use.¹ These vocal deviations include changes in the mucosa of the vocal folds, such as vocal fold edema, vocal fold nodules, or other benign mass lesions; postural changes, such as glottic chink; and other features related to excessive tension in the laryngeal musculature, such as an incomplete glottic closure and a hyperadduction or a constriction of the vocal folds and the laryngeal vestibule, in addition to supraglottic alterations and minor structural alterations.^{1,13–15} Thus, the condition may result in an imbalance of the laryngeal and perilaryngeal musculatures, and patients may present an increase in the quantity, intensity, and frequency of vocal and laryngeal symptoms and musculoskeletal pain.^{4,11,14}

Among the numerous possibilities of treatment for behavioral dysphonia are the various types of laryngeal manual therapy. The term “laryngeal manual therapy” will be used in the present study in a generic way to refer to all procedures involving the digital manipulation of the neck and the cervical structures,^{16,17} which are referred to in the literature by various names, such as manual circumlaryngeal therapy,^{12,18} laryngeal manual therapy,^{4,19} and voice massage.²⁰ The main objective of these interventions is to relax the musculature of the neck, the scapular girdle, and the larynx regions, seeking a muscular balance that enables the phonatory normofunction.^{4,17}

The literature on laryngeal manual therapy shows positive results for the intervention^{4,14,16,17,21,22} and provides evidence that it can accelerate the improvement process and shorten the therapy

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time.^{15,23} Thus, it is believed that it is necessary to systematically review clinical trials on laryngeal manual therapy and to compare the results to those of other interventions through meta-analysis. This method is necessary to provide concrete scientific evidence about their effectiveness and thus to assist the clinician in choosing the most effective treatment for behavioral dysphonia.

Thus, the objective of the present study was to review systematically the literature and to analyze the effectiveness of laryngeal manual therapy in addressing the overall severity of vocal deviation, the intensity of vocal and laryngeal symptoms, and musculoskeletal pain in adults with behavioral dysphonia.

METHODS

Study design

The present study is a systematic review and meta-analysis.

Criteria for considering studies for this review

To elaborate the clinical question and to delimit the criteria for considering the studies for this review, the type of participants, the type of interventions, the type of control groups, and the type of outcomes (PICO) were used.²⁴ Thus, the clinical question that underlies this systematic review was “What is the effectiveness of laryngeal manual therapy compared to other interventions in adults with behavioral dysphonia?”

A methodology of the present study follows the criteria recommended by the Cochrane Library.²⁴ The criteria used for considering studies for this review were

Types of studies: clinical trials (we considered the cluster trial and the crossover trial)

Types of participants: adults with behavioral dysphonia were categorized as behavioral dysphonia, all voice disorders with an etiology related to the use of voice¹

Types of interventions: laryngeal manual therapies were categorized as laryngeal manual therapies, all the procedures involving the digital manipulation of the neck and cervical structures^{16,17}

Types of control groups: other interventions (direct voice therapy) were considered as direct voice therapy, the interventions applied directly to the voice production apparatus²⁵

Types of outcome measures: the three primary outcomes analyzed were

- (1) Auditory perceptual evaluation of vocal quality: overall severity of the vocal deviation—dichotomous classification is better (voice improved after intervention) or unchanged or worse (voice remained or worsened after intervention)
- (2) Vocal and laryngeal symptoms: intensity of vocal and laryngeal symptoms—dichotomous classification is better (symptom severity decreased after intervention) or unchanged or worse (symptom intensity remained or worsened after intervention)

- (3) Musculoskeletal pain: intensity of musculoskeletal pain—dichotomous classification is better (reduced pain intensity decreased after intervention) or unchanged or worse (pain intensity remained or worsened after intervention).

To minimize the differences between the instruments used to obtain data from the three outcomes, the authors decided to transform the protocols with Likert or visual analog scales into dichotomous variables with the categorical responses of better or unchanged or worse. For the Likert scale, a reduction of 1° was considered to be better; maintenance was considered to be unchanged; and the increase of 1° was considered to be worse. As for the visual analog scale, a 10-point change was considered to be different.²⁶ For this, the sum of the difference between the post- and preintervention values for each outcome was used. Values of ≤−10 points were considered to be better, values of ≥10 points were considered to be worse, and values between −10 points and 10 points were considered to be unchanged. For the variable of the overall severity of vocal deviation, only the transformation of the Likert scale values was used, and for the intensity variables of vocal and laryngeal symptoms and the intensity of musculoskeletal pain, only the transformation of the values of the visual analog scale was used.

Search methods for the identification of studies

A systematic search was conducted to identify clinical trials published until October 2016 in the Clinical Trials, Cochrane Library, LILACS, PubMed, and Web of Science databases. These databases were selected because they had the most relevant studies in the health area. There was no restriction regarding the language and the year of publication. The uniterms used referred to populations (dysphonia OR voice disorders) and interventions (therapeutics OR rehabilitation OR voice training OR massage). For the Web of Science and Cochrane Library databases, uniterms related to the type of study (clinical trial) were used, and for PubMed, the Clinical Queries filter was added. In the other databases, the type of the study was not used because the search strategy did not obtain results. Based on these uniterms, a specific search strategy was developed for each database (Figure 1). It was not necessary to contact any author to request the full versions of the articles as they were all available.

Data collection and analysis

The two independent authors performed the search and selection of the articles in October 2016. PICO was considered as the exclusion criteria in the selection stage of the studies. The selection of the studies was based on reading the titles and abstracts of the articles and identifying potentially relevant studies. The relevant studies were read in full to apply the exclusion criteria of the present research. Concomitancy analysis was performed between the two authors' selections (kappa = 0.73, 95.45% concordance, $P < 0.01$). A concordance analysis was performed between the two authors who performed the selection of the articles (kappa = 0.73, 95.45% concordance, $P < 0.01$). The articles that only one of the authors selected were read again in their entirety, and disagreements were discussed by judges, who chose to include or exclude the research. The search and

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