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Relaxation techniques as an element supporting the functioning of the speech apparatus – a review of the literaturę

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Abstract

Introduction

The human speech apparatus is a complex system that relies on the cooperation of the respiratory, phonatory, articulatory, and resonatory systems. Its proper functioning depends not only on physical condition patient, but also on mental state—particularly the level of tension and stress. In disorders such as tension dysphonia, stuttering, vocal overload, or articulation difficulties, relaxation techniques have proven to be effective therapeutic interventions.

Objective

The aim of this article is to present knowledge about relaxation techniques that promote speech relaxation. These methods include progressive muscle relaxation, breathing exercises, laryngeal massage, biofeedback, and mindfulness used in speech therapy and phoniatrics. A review of the literature indicates that the regular use of relaxation techniques improves phonatory quality, reduces muscular tension, and may play an important role in the prevention of voice disorders.

At the same time, the need for further research in this area is evident—particularly studies involving larger sample sizes and the evaluation of long-term effects.

Conclusions

1. Relaxation of the speech apparatus is an important element of both therapy and prevention of voice and speech disorders.

2. Research indicates that techniques such as progressive muscle relaxation, breathing exercises, laryngeal massage, biofeedback, and mindfulness provide significant benefits for patients, including: reducing muscle tension, improving phonatory stability, and achieving greater comfort in everyday communication.

3. Relaxation techniques can be beneficial in the treatment of speech therapy and phoniatric disorders: tension dysphonia, stuttering, articulation difficulties, and vocal overload.

4. Relaxation of the speech apparatus plays a very important role in the prevention of voice disorders, especially among professional voice users.

Keywords: relaxation, voice, speech, dysphonia, stuttering, prevention

Introduction

The human speech apparatus is defined as a set of organs jointly responsible for voice production and the articulation of speech sounds. These organs are part of four fundamental systems: the respiratory, phonatory, articulatory and resonatory systems. Their functions are

closely interrelated, and each plays a distinct role that is essential for proper voice emission [1–3].

The respiratory system serves as the primary source of energy for speech. Air expelled from the lungs acts as the driving force behind both articulation and phonation. Disorders in this system, such as shallow breathing or poor control of the exhalation phase, may impair voice quality [4–5].

The phonatory system, with the larynx as its central structure, converts aerodynamic energy into vibrations of the vocal folds. Proper tone and function of the laryngeal muscles are essential for phonation, and dysfunction in this area may lead to conditions such as dysphonia [6–7].

The articulatory system is responsible for the precise shaping of speech sounds. It includes the tongue, lips, palate and jaw. Any abnormalities within these structures can affect the acoustics of speech. Muscle tension in this area may reduce intelligibility and hinder speech fluency [8–9].

The resonatory system includes the oral, pharyngeal and nasal cavities and acts as a natural amplifier of sound. It is responsible for shaping vocal timbre and intensity. Disorders in this area, such as muscular blockages, may result in a monotonous or nasal-sounding voice [10–11].

These systems function together as a dynamic, integrated mechanism. A change in one component affects the others. For this reason, proper coordination and muscular efficiency are essential for effective communication [12–13].

The proper functioning of the speech apparatus is influenced not only by physical condition but also by psychological factors, particularly stress. Stress activates the fight-or-flight response in the body, which increases muscle tension throughout the body, including in the neck, jaw and larynx [14–18]. Individuals exposed to long-term stressors are more likely to develop voice disorders such as tension dysphonia. Excessive tension in the larynx can lead to rapid voice fatigue, hoarseness and, in some cases, even temporary loss of phonation [19].

Similar mechanisms are observed in stuttering. Stressful situations can intensify muscle tension in the tongue and lips, which disrupts speech fluency. Stress also affects breathing patterns, making them shallower and faster. This destabilizes phonation and reduces control over exhalation [20].

Research indicates that effective speech and phoniatric therapy should include relaxation techniques. Methods such as progressive muscle relaxation, mindfulness and diaphragmatic breathing exercises reduce muscle tension and alleviate anxiety related to speaking [1,6,17–20]. These techniques are valuable not only in treatment but also in prevention [21–23].

There is substantial evidence in the literature that relaxation techniques are highly effective in working with individuals who experience voice and speech disorders. Clinical studies show that progressive muscle relaxation significantly reduces symptoms of tension dysphonia, leading to improvements in acoustic voice parameters and greater speaking comfort [6–12]. Similar effects have been reported in individuals who stutter. Regular use of relaxation and breathing techniques lowers the frequency of disfluencies and reduces anxiety levels [17–20]. Manual methods, such as laryngeal massage, neck muscle relaxation and biofeedback, help patients gain better control over muscular tension and also contribute to therapeutic outcomes [7,11–16]. Although some studies involve small sample sizes, the overall findings suggest that relaxation techniques are an important element of both therapy and prevention [24–25].

Objective

The aim of this review article is to present the current state of knowledge concerning relaxation techniques in the context of speech production. The discussion focuses on the mechanisms underlying these methods, their practical applications in speech therapy and phoniatrics, and their role in voice hygiene and prevention. Another key objective is to identify areas that require further research, in order to develop clear and effective clinical guidelines for treating individuals with voice and speech disorders.

Methods

This article was prepared based on a review of the scientific literature concerning relaxation of the speech apparatus. Three major databases were used for the literature search: PubMed, Scopus and Web of Science. The search was conducted between June and August 2025.

The following keywords were used in various combinations during the search process: speech apparatus, relaxation, muscle tension, dysphonia, stuttering, voice therapy, progressive muscle relaxation, laryngeal massage and biofeedback. For instance, in PubMed, the query "speech apparatus relaxation AND muscle tension dysphonia" returned 42 results. In Scopus,

the search term "laryngeal massage AND stuttering" yielded 18 results. This strategy enabled a broad overview of articles addressing different relaxation methods.

The analysis included publications that met the following criteria: articles published in English, published between 2000 and 2025, and available in full-text format online. Included materials comprised review articles, clinical trials and case reports, provided they addressed relaxation in the context of speech and voice.

Publications were excluded if they were unrelated to the speech apparatus, focused solely on animal studies, or lacked full-text access. Studies limited exclusively to pharmacological or surgical interventions, without reference to relaxation techniques, were also excluded.

This was a narrative review. No meta-analysis or specialised tools were employed to assess the methodological quality of the included studies. The emphasis was placed on a general overview of the methods described and the therapeutic outcomes reported by the authors. The data were organised thematically to allow comparison of different approaches and to evaluate their relevance in therapy and voice prevention.

A limitation of this analysis is that only English-language publications were considered. Some potentially relevant articles were excluded due to lack of access to full-text content. Nonetheless, the collected material provides a broad overview of the current state of knowledge regarding relaxation of the speech apparatus.

Results

Overview of Relaxation Techniques

The literature describes a range of methods designed to reduce muscle tension and improve vocal quality. Excessive tension in the speech apparatus may lead to hoarseness, a loss of speech fluency, or, in more severe cases, complete speech blocks. For this reason, relaxation techniques are increasingly applied in both speech therapy and phoniatric practice [1–3]. Although these methods differ in form and execution, they share a common objective: to restore muscular balance, enhance respiratory control, and reduce stress levels [4–5]. Stress is frequently identified as a primary factor that exacerbates tension in the neck, jaw, and larynx [17–18].

These techniques address both physiological and psychological aspects of vocal production. On the one hand, they train individuals to consciously relax specific muscle groups and improve their breathing technique [6–9]. On the other hand, they reduce the fear associated

with speaking, particularly in situations such as public speaking or reading aloud [17–20]. As a result, the voice becomes more stable, speech becomes more fluent, and the overall act of communication becomes less physically and mentally demanding. Numerous studies emphasize that relaxation should not be viewed merely as a supplementary component of therapy. Rather, it should be considered an integral part of the therapeutic process due to its demonstrable benefits in patients' daily functioning [21–23].

Progressive Muscle Relaxation (PMR)

The effectiveness of progressive muscle relaxation (PMR) is widely documented in the literature. Originally developed by Jacobson, this method involves systematic tensing and relaxing of different muscle groups [1]. Exercises follow a specific sequence, usually progressing from larger muscle groups to smaller, more localized ones [2]. Particular attention is given to the muscles of the neck, face, and jaw, as these areas have a direct impact on voice quality [3].

Regular practice of PMR increases bodily awareness and enables individuals to recognize where excessive tension tends to accumulate. As a result, patients can respond more quickly and restore muscular balance during speech [3–4]. Studies indicate that consistent use of this method leads to improved phonatory stability, reduced hoarseness, and lower levels of vocal fatigue following prolonged use of the voice [5].

Breathing Exercises

Breathing exercises play a key role in voice therapy and are frequently described in the literature as one of the foundational stages of intervention [6–7]. Diaphragmatic breathing is the most commonly recommended technique. This method engages the diaphragm and lower rib cage rather than relying solely on the upper chest for respiration [8]. The result is a calmer, more voluminous airflow that contributes to a more stable vocal output. Individuals who breathe shallowly often struggle with maintaining consistent phonation, and in such cases, diaphragmatic breathing has been shown to yield rapid improvements [9].

Regular practice of breathing exercises enhances exhalation control, allowing for longer speech segments with less effort [6–9]. Over time, individuals also eliminate harmful habits, such as holding their breath before speaking or raising their shoulders during inhalation. Both

research studies and case reports confirm that systematic implementation of these exercises results in clear and lasting therapeutic benefits [6–9].

Laryngeal Massage and Manual Techniques

Manual techniques are often highlighted in the literature as effective tools in the treatment of voice disorders [10–11]. Among these, laryngeal massage is the most frequently mentioned. This method involves gentle compression and relaxation of the muscles in the neck, jaw, and laryngeal region. The primary goal is to reduce muscle stiffness and eliminate blockages that interfere with free voice production. These techniques are typically administered by a trained therapist and are not intended for unsupervised practice [12–13].

After several sessions, patients often report that their voice feels lighter and less strained, and that the sensation of tightness in the throat diminishes [12]. Case studies frequently indicate that improvement may occur quickly, sometimes even after the first treatment [13]. In addition to laryngeal massage, exercises that target the neck and shoulders are also commonly used. This is important because tension in these areas can easily be transferred to the muscles responsible for phonation [12–13].

Biofeedback

In recent years, the use of technology-based techniques has become increasingly common in voice therapy, with biofeedback being among the most prominent methods [14–16]. This technique provides patients with real-time feedback, such as visual displays or auditory signals, which reflect muscle activity, breathing patterns, or vocal characteristics. By observing these cues, individuals can better monitor and regulate their physiological responses.

Studies consistently show that biofeedback is especially effective for individuals with tension dysphonia, as it enables them to identify and correct laryngeal tension more accurately [14]. In the case of stuttering, biofeedback helps individuals maintain a more consistent speech rate and reduces the occurrence of speech blocks [15]. Additionally, patients tend to be more engaged in therapy when they can immediately observe the outcomes of their efforts, which enhances both understanding and motivation [16].

Mindfulness and Visualization

An increasing number of authors highlight the importance of methods that target psychological as well as physical factors. These include mindfulness practices, meditation, and guided visualization techniques [17–18]. The primary objective of such methods is to reduce

stress, which is known to contribute significantly to muscle tension in the neck, jaw, and laryngeal areas, thereby negatively affecting voice quality [19].

Systematic use of these techniques improves focus on breathing and supports relaxation of the entire body [17–20]. Research shows that individuals who incorporate mindfulness into their daily routine are less likely to experience anxiety related to speaking and are better able to manage high-pressure situations, such as speaking in groups or reading aloud [21–22]. Visualization exercises, such as imagining a calm environment or mentally rehearsing uninterrupted speech, have proven particularly helpful for individuals who stutter [20]. When combined with breathing exercises, these techniques further enhance speech fluency and support a more natural vocal tone [23].

Application of relaxation techniques in various disorders

Tension Dysphonia

Tension dysphonia is one of the most frequently described voice disorders and is directly associated with excessive muscle tension within the phonatory system. In individuals affected by this condition, the voice becomes less clear, hoarseness appears, and there is a sensation of rapid vocal fatigue, as well as difficulty in maintaining stable phonation [1–3]. In many cases, patients also report a sensation of tightness or blockage in the throat, which further intensifies discomfort during speech [4–5].

The literature highlights that relaxation techniques can significantly improve vocal function in individuals with tension dysphonia [6–8]. Progressive muscle relaxation helps release tension in the laryngeal muscles, facilitating proper voice production [9]. Breathing exercises support exhalation control and stabilize phonation, which translates into a clearer and more effortless voice [6–9]. Laryngeal massage also plays an important role and, according to many case studies, produces noticeable and rapid improvements [10–12]. Patients undergoing this method often report that their voice feels lighter and that the sensation of tension in the neck and throat gradually decreases [13].

Stuttering

Stuttering is a disorder that has long drawn the attention of researchers and clinicians, as its presentation is closely linked to emotional factors and muscle tension. It is characterized by speech interruptions, sound prolongations, and blocks that occur suddenly and are often unpredictable. Many individuals observe that their symptoms worsen in stressful situations, such as speaking with strangers or addressing an audience [17–20]. During such moments, the muscles of the tongue, lips, and larynx become increasingly tense, which disrupts speech fluency.

Relaxation techniques can be a valuable component in the therapy of individuals who stutter. Progressive relaxation exercises help reduce muscular stiffness during speech blocks [1–3]. Breathing exercises are equally important, as they promote control over the exhalation phase and reduce the tendency to hold the breath before speaking [6–9]. Techniques involving mindfulness and visualization are also gaining recognition due to their ability to reduce anxiety and enhance the speaker's sense of control [17-23]. Patients using these methods frequently report a greater sense of ease and reduced avoidance of communication. The literature confirms that combining relaxation techniques with traditional speech therapy significantly enhances treatment outcomes for stuttering [24–25].

Vocal Overload

Vocal overload is a common issue among individuals who use their voice professionally. This group most often includes teachers, actors, singers, and academic lecturers, although similar problems are also observed in professionals who speak frequently, deliver presentations, or conduct training sessions [21–23]. Symptoms typically include rapid vocal fatigue, reduced clarity of speech, hoarseness, and occasionally pain in the throat and neck. Ignoring these signs over time may lead to more serious conditions, such as chronic dysphonia or lesions on the vocal folds [19].

The literature underscores the role of relaxation techniques in the prevention of vocal overload. Breathing exercises, particularly diaphragmatic breathing, enhance vocal support and reduce the risk of vocal strain [6–9]. Progressive muscle relaxation helps to alleviate tension that accumulates in the neck and jaw after prolonged speaking [1–5]. Manual methods, including laryngeal massage, are also commonly applied and often bring immediate relief, facilitating further voice use [10–13].

The psychological dimension of vocal overload should not be overlooked. Individuals who experience persistent vocal fatigue may also develop frustration and anxiety related to

communication. In such cases, stress-reducing techniques such as mindfulness and guided visualization prove useful [17–20, 21–23]. These methods contribute to both physical relaxation and emotional balance, which positively influence the muscles involved in phonation.

For these reasons, vocal overload prevention should integrate classical voice hygiene measures, such as maintaining hydration, taking breaks during prolonged speaking, and avoiding excessive vocal effort, with the regular use of relaxation exercises [21–23]. This approach not only supports faster recovery of vocal performance but also reduces the risk of developing more severe voice disorders.

Articulation Disorders

Articulation disorders refer to difficulties in the correct formation of speech sounds. These issues most often stem from improper functioning of the tongue, lips, or jaw [8–9]. When the muscles of these structures are overly tense or lack coordination, individuals may experience mispronunciations, and overall speech clarity may decrease [12–13]. It is frequently observed that facial muscle tension increases during stressful situations [17–20], which further exacerbates articulation difficulties and reinforces incorrect speech patterns.

The literature indicates that relaxation techniques can substantially support articulation therapy. Exercises that relax the jaw, tongue, and lips promote greater freedom of movement, resulting in more accurate sound production [8–9]. Breathing techniques also contribute by providing a stable exhalation, which supports articulation and improves speech rate control [6–9].

Manual techniques, including facial and neck massage, are used in therapeutic practice to reduce muscle stiffness, which often impedes accurate articulation [10–13]. In parallel, stress management strategies such as mindfulness and visualization help reduce the emotional factors that influence muscle tension [17–23].

Consistent integration of relaxation techniques with standard articulation therapy yields the best results. It improves speech intelligibility and enhances the patient's comfort in daily communication.

Voice Prevention and Hygiene

Vocal prevention is as essential as therapy itself, as it helps reduce the risk of vocal overload and long-term phonatory issues. In everyday life, both physical and psychological factors affect voice quality [19, 21–23]. Inadequate hydration, overuse of the voice, and

improper breathing habits may lead to chronic conditions and, in the long term, even to serious voice disorders. The literature stresses that the regular use of relaxation techniques is a crucial component of prevention, especially for individuals who rely heavily on their voice in daily life [1–16, 24–25].

Fundamental principles of vocal hygiene include maintaining adequate hydration, avoiding smoking or smoky environments, and taking breaks during extended periods of speaking [21–23]. Proper body posture also plays an important role [12–13], as musculoskeletal tension, particularly in the spine and shoulders, can directly affect the phonatory system.

Relaxation techniques complement these preventive measures by alleviating muscle tension caused by fatigue or stress [1–5, 17–20]. Progressive muscle relaxation, breathing exercises, and laryngeal massage support the maintenance of vocal health [6–13], while mindfulness practices help reduce psychological stress, one of the most common factors contributing to voice problems [17–23].

In practice, individuals who consistently apply vocal hygiene principles experience fewer overload-related issues and recover more quickly from vocal fatigue [21–25]. Therefore, preventive care should be regarded as a continuous aspect of voice use, rather than as a reactive measure applied only during crises.

Discussion

A review of the literature indicates that relaxation techniques play a significant role in the therapy of individuals with voice and speech disorders. Numerous studies have confirmed that regular practice of exercises such as progressive muscle relaxation, breathing training, and laryngeal massage contributes to improved voice quality and a reduction in muscle tension [1–13]. Patients also frequently report greater comfort during everyday communication. Importantly, beneficial effects have been observed across a range of disorders, including tension dysphonia, stuttering, and vocal overload [6–10, 17–20]. This suggests that relaxation techniques support the functioning of the entire speech apparatus, rather than acting selectively on individual components.

However, several limitations should be acknowledged. Some of the referenced studies were preliminary in nature and involved small sample sizes [14–16]. While the findings are promising, they require confirmation through larger-scale research. There is also a lack of long-term studies assessing the durability of therapeutic effects. It remains unclear how long the

benefits of relaxation techniques persist and whether ongoing practice is necessary to maintain improvements over time [15–16].

The literature presents a wide range of methodological approaches. Authors describe the use of breathing exercises, body awareness training, and biofeedback interventions [6–9, 21–23]. This diversity makes direct comparisons of effectiveness between methods challenging. Nevertheless, clinical practice suggests that the most favorable outcomes are achieved through a combination of techniques. Integrating muscle relaxation with breathing strategies or mindfulness elements allows for a more comprehensive therapeutic approach and increases the likelihood of improvement [17–23].

The preventive value of relaxation is also receiving increasing attention. Studies involving teachers and singers demonstrate that regular implementation of relaxation exercises reduces the risk of vocal overload and helps maintain vocal health over the long term [18–19, 24–25]. These findings highlight the importance of incorporating relaxation not only as a response to existing problems but also as a proactive measure aimed at preventing voice disorders.

In conclusion, relaxation techniques represent a valuable complement to both speech and phoniatric therapy. However, further research is required to determine which methods are most effective and what outcomes can be achieved in the long term [14–16].

Conclusions

1. Relaxation of the speech apparatus is an important element of both therapy and prevention of voice and speech disorders.

2. Research indicates that techniques such as progressive muscle relaxation, breathing exercises, laryngeal massage, biofeedback, and mindfulness provide significant benefits for patients, including: reducing muscle tension, improving phonatory stability, and achieving greater comfort in everyday communication.

3. Relaxation techniques can be beneficial in the treatment of speech therapy and phoniatric disorders: tension dysphonia, stuttering, articulation difficulties, and vocal overload.

4. Relaxation of the speech apparatus plays a very important role in the prevention of voice disorders, especially among professional voice users.

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Conflict of Interest

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