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Body Pain in Professional Voice Users

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Abstract

The association between body pain and voice disorder symptoms has been clinically observed but not properly investigated. Intense voice use in which there is an overloading of the vocal mechanism, with strain and effortful phonation may cause discomfort or even pain while speaking. The purpose of this research was to identify, categorize and compare body pains among different professional voice users, their vocal self-assessment, their voice complaints and their sick leave history. A total of 840 individuals, 591 women and 249 men (150 non-professional voice users, 100 20 popular singers, 50 classical choral singers, 150 telemarketers, 150 speech-language pathologists, 90 actors and 150 teachers) volunteered to participate in this study. They answered a self-assessment questionnaire that investigated voice usage, voice complaints and presence of 13 different body pains. Results show that teachers presented the highest mean number of body aches pains (7.41) and the group of classical singers presented the lowest mean number (2.46). Those with voice complaints presented higher means of body pains (5.68) when compared to those without voice complaints (3.76). In addition, subjects that reported sick leave had higher means of body pains. The current study indicates that there may be a connection between body pain and training specific voice training once it may play a positive role on the management, development and perception of body pain in trained professionals, such as classical singers.

Keywords: Vocal mechanism; Voice; Throat; Vocal training; Laryngeal muscle

Introduction

According to the International Association for the Study of Pain–IASP, pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" [1]. Pain may be classified according its duration (acute or chronic), recurrence (single or multiple episodes), intensity (measured by scales), frequency (sporadic or constant) or according to the pain quality (burning, throe, shock, cut, pressure, pulse or tingle). People usually classify their pain according to their previous experiences; some researches indicate that men and women react differently when exposed to similar pain experiences [2,3]. The Sociedade Brasileira de Estudos da Dor SBED (Brazilian Society of Pain Studies) [4] identifies different pain-related aspects, such as biological (tissue injuries, physical condition, medical effects), social (social support, familiar relationship and cultural influences) and psychological (behavior, personality and educational level) as the influences for individual pain sensation. The association between body pain and voice disorders has been clinically observed but not properly investigated. Intense voice use in which there is an overloading of the vocal mechanism, with strain and effortful phonation may cause discomfort or even pain while speaking. The pain experienced during voice production is called odynophonia and is considered a sign or symptom of voice problem [5]. Pain while speaking can be caused by organic conditions, such as gastresophageal reflux or granuloma but also by behavioral aspects that may lead to a muscle tension dysphonia [6-9]. Any individual can experience voice problems and pain symptoms; however, the impact on professional voice users, who rely on their voices as a primary tool of work, may be detrimental. Professional voice users must have special care towards avoiding the development not only of laryngeal maladaptation but also any, body muscle disorder. Having a good voice quality also depends on having a good body wellbeing [10]. A recent study has observed that throat, neck, head, back, shoulder and ear pain are expressively more frequent on professional voice users. The study point 13 out that sore throat is more usual in individuals that use their voices at work [11]. Brazilian studies show that popular singers report predominantly the following pains: sore throat, pain while speaking and neck pain. All these types of pains are close to the larynx, and are not related to gender [12]. Classical choir singers showed low rates of body pain in comparison to the general population [13]. Furthermore, these studies found out that telemarketers experience more body pains that are both close to and far from the larynx and have greater need to call sick due to voice problems than the general population. These findings highlight the fact that vocal and physical fatigue is common to these professionals [13]. Vocal training can be considered a prophylactic measure against voice disorders as it stimulates a well-adjusted use of muscles involved in the voice production. In addition, vocal training can provide a better muscle endurance and consequently, less occurrence of body pain, mostly those located close to the larynx. Considering this hypothesis, in the present study different voice professional users, with different voice usage and load were assessed and inquired about their perception of body pains [14]. The purpose of this research was to identify, categorize and compare body aches among different professional voice users, according to vocal self-assessment, voice complaints and sick leave.

1. GENERAL INFORMATION					
Full name: Date: / /					
Gender: ( ) female ( ) male					
Age: Birth date: / /					
Profession:					
2. PRESENCE OF VOICE PROBLEMS					
Have you experienced any voice problem at work?				Yes	No
Have you ever experienced a work restraint due to a voice problem?				Yes	No
3. VOICE SELF-ASSESSMENT					
How do you evaluate your voice?	Excellent	Good	Fair	Poor	Very poor
4. BODY PAIN SELF-REPORT SURVEY [11]					
During or before using voice at work, do you feel any of these symptoms? In case of positive answer, mark its frequency for each body ache.					
a. Headache	Never	Sometimes	Often	Frequently	Always
b. Mandibular pain	Never	Sometimes	Often	Frequently	Always
c. Tongue pain	Never	Sometimes	Often	Frequently	Always
d. Throat pain	Never	Sometimes	Often	Frequently	Always
e. Back of the neck pain	Never	Sometimes	Often	Frequently	Always
f. Shoulder pain	Never	Sometimes	Often	Frequently	Always
g. Backache	Never	Sometimes	Often	Frequently	Always
h. Neck pain	Never	Sometimes	Often	Frequently	Always
i. Chest pain	Never	Sometimes	Often	Frequently	Always
j. Arm pain	Never	Sometimes	Often	Frequently	Always
k. Hand pain	Never	Sometimes	Often	Frequently	Always
l. Earache	Never	Sometimes	Often	Frequently	Always
m. Pain while speaking	Never	Sometimes	Often	Frequently	Always

Figure 1: Questionnaire of Vocal Condition and Body Aches during Professional Activity

Methods

This research was approved by the Institutional Review Board of UNIFESP (CEP-UNIFESP#1050/11). A total of 840 individuals, 591 women and 249 men volunteered to participate in this study. The participants were recruited either via E-mail or personal invite and received the same questionnaire with the same answer orientations. The latter took place in courses, congresses, meetings, organizations and authors' personal contact. 150 non-professional voice users (housekeepers, students, factory workers designers, among others), 100 popular singers (pop singers, backing vocals, jazz singers, rock band singers), 50 classical choir singers (operatic and non-operatic singers), 150 telemarketers (receptive or active), 150 speech-language pathologists (with different specializations: language, voice, orofacial myology and hearing), 90 actors (professional theater actors) and 150 teachers (elementary and high school teachers). All professional voice users were working during data collection. All subjects were instructed to answer a simple questionnaire (Figure 1) about: 1. Demographic information (name, gender, age and profession); 2. Presence of voice problems (work-related vocal signs or symptoms); 3.Voice self-assessment (excellent, good, fair, poor, very poor vocal quality); and 4. Body pain self-report survey [11]. The presence of body pain was assessed according to its frequency. 13 types of body pain were included in the survey: headache, mandibular pain, tongue pain, sore throat, back of the neck pain, shoulder pain, backache, neck pain, chest pain, arm pain, hand pain, earache, pain while speaking. Participants rated the frequency of each specific body pain on a 5-point scale: never, sometimes, often, frequently and always. For the purposes of data analysis, the frequencies were grouped. This way, the answers "sometimes, often, frequently and always" were considered as presence of pain and never was considered absence of pain. The mean number of body pain for each professional group was assessed by a simple mean account what represents a sum of all positive body pain divided by the number of professionals at the group analyzed. For statistical analysis, the software SPSS (Statistical Package for Social Sciences), version 19.0 was used. The level of significance adopted was 5% or 0.05.

Results

The group of teachers presented the highest mean number of body pains (7.41) and the group of classical singers the lowest one (2.46)- Table 1. Participants with voice complaints presented higher mean of body pains (5.68) when compared to those without voice complaints (3.76) (Table 2). Table 3 shows the correlation between body pain and vocal self-assessment. This was an interesting result, because data showed that the worse the vocal self-assessment, the higher the mean number of body pains. Table 4 exhibits the correlation between sick leave and the presence of body pains. The 3 most common body pains for each group according to profession are presented in Table 5. Sore throat was the most reported pain among all professional voice users and it was more frequent for teachers than for the others professions selected for this research.

Groups	N	Body pain average	SD	P value
Non-professional voice users	150	4.41	3.41	
Popular Singers	100	2.92	2.31	
Classical Choir Singers	50	2.46	2.04	
Telemarketers	150	4.61	3.04	
				<0.001*
SLP	150	4.83	2.84	
Actors	90	3,53	2.98	
Teachers	150	7.41	3.44	
Total	840	4.67	3.35	

Table 1: Menas and Standard deviations of body pain average for non-professional voice users, popular singers, classical choir singers, telemarketers, speech-language pathologists (SLP), actors and teachers. (* Significant values (p ≤ 0 .05) – Kruskal-Wallis Test)

Voice Complaint	N	Mean Body Pain	SD	P value
Yes	398	5.68	3.32	
No	442	3.76	3.11	<0.001*
Total	840	4.67	3.35	

Table 2: Mean and Standard deviation of body pain and voice complaints. (* Significant values (p ≤ 0 .05) – Kruskal-Wallis Test)

Vocal self-assessment	N	Mean Body pain	SD	P value
Excellent	148	3.45	3.04	
Good	458	4.58	3.13	
Fair	208	5.59	3.67	
				<0.001*
Poor	25	5.6	3.71	
Very Poor	1	10	0	
Total	840	4.67	3.35	

Table 3: Vocal self-assessment and body pain (* Significant values (p ≤ 0 .05) – Kruskal-Wallis Test)

Sick Leave	N	Mean Body Pain	SD	P value
Yes	116	5.85	3.5	
No	724	4.48	3.29	<0.001*
Total	840	4.67	3.35	

Table 4: Body pain and sick leave (* Significant values (p ≤ 0 .05) – Mann-Whitney Test)

Groups	Body Pain	N	%
	Back pain	86	57.3
Non-professional voice users	Throat pain	75	50
	Neck pain	73	48.6
Popular singers	Throat pain	66	66
	Pain while speaking	41	41
	Neck pain	35	35
Classical choral singers	Throat pain	28	56
	Back pain	19	38
	Shoulder pain	15	30
Telemarketers	Costas	99	66
	Back of the neck pain	96	64
	Headache	92	61.3
Speech-language pathologists	Back pain	111	73.5
	Shoulder pain	109	72.2
	Neck pain	95	62.9
Actors	Throat pain	61	67.7
	Neck pain	42	46.6
	Shoulder pain and Back pain	39	43.3
Teachers	Throat pain	133	88.6
	Back pain	115	76.6
	Shoulder pain	109	72.6

Table 5: The three most self-reported body aches for each studied group

Discussion

Professional voice users with high vocal demand are a potential group for developing voice disorders, especially if they do not have any voice training. Researches have already shown high prevalence of pain in those professionals; predominantly pains close to the larynx, where the voice source is [11]. The voice clinical practice suggests that many patients with voice disorders also experiences some kind of vocal discomfort due to laryngeal muscle effort. Vocal tract discomfort is not only related to pain but a condition that compromises it's functionality such as throat burning, dryness, itch, tightness, pain, irritation, sensible or feeling something on the throat [15]. When analyzing this research data, the teacher's group showed highest mean number of body pain while the group of classical choir singers presented the lowest mean number (Table 1). Classical choir singers generally undergo formal vocal training and are submitted to an intense routine of voice-related muscle conditioning and endurance practice [13,16]. This is probably the reason why the occurrence of different body pains is smaller for these professionals than for the other ones. This may be related to the physiological adjustments improved by the voice training as well as to the emotional and psychological factors enhanced by the frequent singing classes, which are taken as an enjoyable activity [17]. Furthermore, professional voice users, particularly the artistic category usually takes better care of their voices by observing vocal hygiene guidelines [18]. Individuals with voice complaints reported more body aches than individuals without voice complaints (Table 2). This result was probably observed because a voice disorder for professional voice users may be related not only to the structures involved in the voice production, but also to anybody tension that leads to discomfort during phonation [19]. There are many structures and systems that interfere with phonation [11,20], and this is probably the reason why this research data shows that the higher the amount of body pains, the worse the vocal self-assessment (Table 3). Subjects that reported having to call sick showed higher means of body pains (Table 4), probably because a professional voice user with body pain may have limitations to perform their daily work tasks. Musculoskeletal pain is a known consequence of repetitive strain, excessive usage and work-related musculoskeletal disorders. It is considered one of the biggest health problems of the modern world [1]. A recent survey of a Brazilian governmental institute responsible for pensions, lost time claims and disability shows that one in a hundred individuals has some kind of repetitive strain injury symptoms, and that this is the second biggest cause of sick leave in this country [21]. Even though voice disorders are not legally considered as an occupational dysphonia in Brazil, in some European countries, such as Poland, it is a well-established conception [22]. Professional voice users tend to be more aware of their throat area and more critical of their voice quality. For instance, a minimal voice change for singers may epresent a huge problem [23]. This is probably the reason why sore throat has been the mostly reported body pain by all studied professions corroborating with previous researches [11]. Despite this large singer's awareness, sore throat was also greatly reported by teachers. It is likely that this finding was observed because this group undergoes a very high voice load; they usually do not use amplification systems and do not have. All these factors can lead to strain and effortful phonation, which contribute to vocal tract discomfort, which is considered a degree of pain [19,20,24,25]. Moreover, classroom acoustics is usually poor in elementary schools and it may represent an additional stress to the teacher [26]. Treatment and training programs for professional voice should include strategies for prevention and remission of pain. Therapeutic strategies for a better and more comfortable voice usage must be included when dealing with professional voice users, such as the laryngeal manual therapy. All clinicians should assess for presence of body pains during assessment.

Conclusion

Pain is a common symptom among professional voice users. Sore throat was the most frequently reported body pain by all the professional voice users in this study. Teachers have more body pains, worse voice self-assessment, high incidence of voice complaints and more frequent sick leave due to a voice problem. Singers and actors presented the lowest number of body pains, voice complaints and sick leave indicating that voice training may positively interfere on their perception of body pain. Specific voice training may play a positive role on the management, development and perception of body pain in trained professional voice users, such as classical singers.

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