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Artigo Original

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Self-perception of voice symptoms and vocal health and hygiene knowledge in popular and classical singers

Autopercepção de sintomas vocais e conhecimento em saúde e higiene vocal em cantores populares e eruditos

Keywords

Voice
Singing
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ABSTRACT

Purpose: Verify the perception of popular and classical singers in relation to vocal symptoms and their possible relations regarding knowledge of health and vocal hygiene. **Method:** This study was composed of 242 singers, aged between 17 and 60, of both sexes. A total of 56 singers were selected, with 186 singers, divided into 104 Popular Singers Group (PSG) and 82 Classical Singers Group (CSG). All participants answered the questionnaire for identification and also vocal self-assessment, and two protocols were applied, namely: Brazilian validated version of Voice Symptom Scale - VoiSS (*Escala de Sintomas Vocais* - ESV) and *Questionário de Saúde e Higiene Vocal* (QSHV). **Results:** The largest number of participants was female. The classical singers presented more time of singing class than the popular ones. Show hours of 1-2 hours was higher in the number of subjects responding to both groups of singers. Classical singers presented greater perception of vocal symptoms when compared to the popular ones for total and emotional scores of the Brazilian validated version of VoiSS. The popular and classical groups do not make any difference regarding health and vocal hygiene, even though the groups obtained values above the QSHV normality score. There was no correlation between knowledge about vocal health and hygiene and vocal symptoms in singers. **Conclusion**: Classical singers are more affected by vocal changes, especially women. The singers obtained a good degree of knowledge in vocal hygiene, not differing about the styles. The perception of vocal alteration in popular and classical singers seems to have no relation with the degree of health knowledge and vocal hygiene.

Descritores

Voz
Canto
Protocolos
Inquéritos e Questionários
Conhecimento
Fonoaudiologia

RESUMO

Objetivo: Analisar e relacionar a percepção dos sintomas vocais, o conhecimento de saúde e higiene vocal em cantores populares e eruditos. **Método**: Participaram da pesquisa 186 cantores de ambos os sexos, na faixa etária de 17 a 60 anos, divididos em: Grupo Cantores Populares (GCP) - 104 cantores populares; Grupo Cantores Eruditos (GCE) - 82 cantores eruditos. Todos os participantes responderam a três instrumentos: o questionário de autoavaliação vocal, a Escala de Sintomas Vocais (ESV) e o Questionário de Saúde e Higiene Vocal (QSHV). **Resultados:** O maior número de participantes foi do sexo feminino. Os cantores eruditos apresentaram maior tempo de aula de canto. Horas de shows de 1-2 horas foi maior em número de sujeitos respondentes para os dois grupos de cantores. Os cantores eruditos apresentaram maior percepção de sintomas vocais quando comparados aos populares para os escores total e emocional da ESV. Cantores populares e eruditos não apresentaram diferenças no conhecimento em saúde e higiene vocal, ambos os grupos obtiveram valores acima da nota de corte de normalidade do QSHV. Não houve correlação entre o conhecimento em saúde e higiene vocal e os sintomas vocais em cantores. **Conclusão:** Cantores eruditos são mais afetados por alterações vocais, principalmente as mulheres. Os cantores obtiveram um bom grau de conhecimento em higiene vocal, não diferindo em função dos estilos. A percepção de alteração vocal em cantores populares e eruditos parece não ter relação com o grau de conhecimento de saúde e higiene vocal.

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INTRODUCTION

Singing is a skill that can be developed through the learning of vocal adjustments that involve organic, technical and psychological factors[1]. These adjustments require the singer to master the singing technique. Such mastery allows him/her to use his/her vocal instrument to perform the necessary adjustments to each singing style[2]. Among the singing styles, there are the classical and the popular.

In the singing population, mastering the singing technique does not mean that the singers understand the anatomy of the vocal tract for each adjustment. The lack of understanding about the changes that occurred in the larynx and in the resonance cavities during singing can have negative consequences for the singer's voice[3]. The most common vocal symptoms in this population are: hoarseness, difficulty in the highs, constant throat clearing, voice failures, loss of voice, dry throat and weak voice[4,5]. In addition to symptoms, incorrect adjustments can lead to the development of changes in vocal quality. For professional singers, these changes can impact their quality of life, as these professionals use their voices to work[6].

Some singers also tend to have inappropriate vocal habits. This occurs mainly with popular singers, who make use of harmful resources for the voice such as alcoholism, smoking and narcotic substances[6].

Another data found in the literature concerns the singers' lack of knowledge about vocal health and hygiene. This parameter is also considered as one of the etiologies of the voice problems observed in these professionals[5,7,8]. Thus, having knowledge about vocal health and hygiene can prevent vocal changes, allow greater vocal longevity for singing[9] and contribute to greater self-knowledge, helping the singer in the development of his/her professional career[1,8].

Therefore, studies on the perception of voice symptoms and knowledge about vocal health and hygiene in singers, as well as whether there is an association between them, and whether this is related to the singing style or to the singer's sex, provide relevant scientific evidence for the practice of both the singers themselves and the professionals who work with this audience.

It is evident the growth of scientific productions performed by Speech-Language Pathologists (SLP) to better understand the singers' voice, in search of greater management, counseling and precise assistance in this population, but studies that compare popular singing with classical are still scarce. The hypothesis of this research is that classical singers have more perception of vocal symptoms and more knowledge about vocal health and hygiene than popular singers.

Thus, this study aimed to analyze and relate the perception of vocal symptoms and the knowledge of health and vocal hygiene in popular and classical singers.

METHOD

This is a cross-sectional and analytical study, approved by Ethics and Research Committee of *Universidade Veiga de Almeida* – UVA – (report: 080457/2017, CAAE: 71501917.8.0000.5291).

The inclusion criteria were: popular and classical singers, aged from 18 to 60 years old, of both sexes, who adhered to the Free and Informed Consent Form (FICF), who completely filled out the clinical and vocal socio-demographic questionnaire, prepared by the authors in order to obtain information such as age, sex, smoking, drinking, singing style, singing lessons, frequency of shows, ENT and/or SLP evaluation. In the included participants, some data from the questionnaire were used to characterize the sample. Individuals whose data collection instruments were incomplete were excluded from the study.

242 singers from all over Brazil participated in the study, being 156 popular singers and 86 classical, who responded voluntarily and individually to the data collection instruments, in person or via online through Survey Monkey. The face-to-face participants signed and the virtual participants selected the option "participate in the research" of the FICF, authorizing their participation and dissemination of the data. After applying the selection criteria, 186 singers remained in the survey, divided into two groups according to the singing style: Popular Singers Group (PSG) - 104 popular singers, average age of 34.4 years; Classical Singers Group (CSG) - 82 classical singers, with an average age of 34.2 years.

Each singer answered three instruments: the vocal self-assessment questionnaire for the singing voice, the Brazilian validated version of Voice Symptom Scale (VoiSS)[10,11] and the *Questionário de Saúde e Higiene Vocal* (QSHV)[7].

The vocal self-assessment questionnaire was developed by the study authors in order to obtain information about the singer's perception of his/her singing voice. The participants received a protocol in which they should check the option that best corresponded to the perception of their voice today: excellent, very good, good, reasonable or bad.

The Brazilian validated version of VoiSS is a self-assessment instrument for vocal symptoms and the impact of a voice problem, consisting of 30 items. Each respondent should indicate the frequency of occurrence of each of the vocal symptoms. The answers to the questions are scored between zero and four, as follows: zero - never, one - rarely, two - sometimes, three - almost always, and four - always. At the end of the completion, the total score and the three subscales of the protocol were calculated and defined by simple sum of the values of the responses of each item. The total Brazilian validated version of VoiSS score indicates the perception of the presence of vocal symptoms (maximum 120). The protocol also analyzes the subscales of voice impairment (maximum 60), emotional (maximum 32) and physical (maximum 28). The cutoff value attributed to the total was 16 points, which means that healthy vocal individuals tend to have scores equal to or less than this value[11].

The QSHV contains 31 items and aims to measure knowledge about vocal health and hygiene[7]. Each participant should mark in each item of the instrument what they believed to be positive, neutral or negative for their voice. The total score was calculated by simple summation, assigning a point for each correct answer. The cutoff value of the instrument was 23 points, which means that vocally healthy individuals tend to have scores equal to or greater than this value[7].

The data obtained were tabulated and submitted to descriptive and inferential statistical analysis, using the software Statistica

17.0 and Statistical Package for Social Science (SPSS) 25.0. A descriptive analysis of the variables in the clinical and vocal socio-demographic questionnaire was carried out, as well as self-assessment to characterize the groups. To test the normality of the variables, the Shapiro Wilk Test was used, and all variables had a non-normal distribution. Thus, for the comparison of the two independent groups in terms of quantitative variables, the non-parametric Mann-Whitney test was used. To perform the association of the two independent groups with the nominal qualitative variables, Pearson's Chi-square test was used. To correlate the findings of the two protocols, the non-parametric Spearman Correlation Test was used. A significance level of 5% ($p<0.05$) was considered for all inferential statistical analyzes.

RESULTS

In the vocal self-assessment, the classification "excellent" in the CSG was more frequent, with 42%, and good in the PSG, with 48%. The "bad" category was mentioned only in the PSG, with 2%.

It was observed that in the PSG, the singing lesson time was significantly shorter than in the CSG ($p<0.001$). There was no difference between the groups regarding the age variable (Table 1).

Table 1. Comparison of socio-demographic, clinical and vocal variables according to the singing style

Variable	Singing style				*p*-value
	PSG		CSG		
	Average	Median	Average	Median	
Age	34.28	34.00	34.41	32.50	0.638
Singing lessons (years)	5.06	1.50	9.37	7.00	<0.001*

*$p<0.05$ - Mann-Whitney test
PSG = Popular Singers Group; CSG = Classical Singers Group

It was observed that, in the comparison of the variable show hours, the category 1-2 hours was significantly more frequent in both groups ($p = 0.005$ - Table 2). It was observed that some subjects from the PSG and none from the CSG were smokers, while few subjects from the PSG and the majority from the CSG were alcoholics, both with no statistically significant difference between the groups. In both groups, the 1-2 hour show time was more frequent. It was found that 47.6% of the CSG and 52.9% of the PSG reported having already had an ENT evaluation, with no statistically significant difference between the groups. As for the reason for the ENT evaluation, it was observed that the subjects of the CSG and the PSG had "hoarseness"; in a similar proportion, the PSG and the CSG presented the symptom "pain" and "aphonia". Both groups reported having undergone voice therapy, and the most frequent reason was "difference in voice", in the CSG, and "difficulty in singing", in the PSG, with no difference between the groups.

Table 2. Comparison of socio-demographic, clinical and vocal variables according to the singing style

Variables and categories	Singing style				p-value
	PSG		CSG		
	n	%	n	%	
Gender					
Male	29	35.4%	40	38.5%	0.664
Female	53	64.6%	64	61.5%	
Smoke					
No	82	100.0%	100	96.2%	0.358
6-10 packs	0	0.0%	1	1.0%	
1-5 packs	0	0.0%	2	1.9%	
1 pack	0	0.0%	1	1.0%	
Alcoholic					
No	43	52.4%	70	67.3%	0.225
Only at parties	29	35.4%	26	25.0%	
On the weekends	8	9.8%	6	5.8%	
Daily	2	2.4%	2	1.9%	
Show hours					
Every day	3	3.7%	2	1.9%	0.005*
5-6h	4	4.9%	1	1.0%	
3-4h	4	4.9%	22	21.2%	
1-2h	71	86.6%	79	76.0%	
Hours of singing					
8h or more	5	6.1%	5	4.8%	0.222
6-7h	7	8.5%	3	2.9%	
4-5h	9	11.0%	10	9.6%	
3-4h	18	22.0%	16	15.4%	
1-2h	43	52.4%	70	67.3%	
ENT evaluation					
No	43	52.4%	49	47.1%	0.745
Hoarseness	23	28.0%	28	26.9%	
Ache	4	4.9%	6	5.8%	
Aphonia	4	4.9%	4	3.8%	
Others	8	9.8%	17	16.3%	
Voice Treatment					
No	48	58.5%	61	58.7%	0.435
Difficulties in high notes	5	6.1%	8	7.7%	
Difficulties in singing	10	12.2%	19	18.3%	
Vocal changes	19	23.2%	16	15.4%	

*$p<0.05$ - Pearson's chi-square.
Caption: n = number; % = percentage; ENT = Ear Nose and Throat; PSG = Popular Singers Group; CSG = Classical Singers Group

As for the comparison between the Brazilian validated version of VoiSS and QSHV instruments according to the singing style, it was observed that the PSG had significantly lower scores than the CSG in the total (p=0.035) and emotional (p=0.026) domains of the Brazilian validated version of VoiSS scale (Table 3).

Table 3. Comparison of the variables of the VoiSS and QSHV protocols according to the singing style

Questionnaire	Singing style				p-value
	PSG		CSG		
	Average	Median	Average	Median	
VoiSS					
Total	18.92	16.50	23.49	21.50	<0.035*
Impairment	10.20	8.00	11.98	10.50	0.113
Emotional	2.36	1.00	4.09	2.00	<0.026*
Physical	6.37	6.00	7.43	7.00	0.082
QSHV					
Total	25.80	28.00	26.94	28.00	0.444

*p<0.05 - Mann-Whitney test
Caption: VoiSS = Voice Symptom Scale; QSHV = *Questionário de Saúde e Higiene Vocal*; PSG = Popular Singers Group; CSG = Classical Singers Group

In the result of Brazilian validated version of VoiSS and QSHV by sex of singers, it was observed that female singers had significantly higher scores in the emotional domain of the Brazilian validated version of VoiSS questionnaire than those of men (p=0.042). There was no difference in the other Brazilian validated version of VoiSS domains and for the QSHV (Table 4).

Table 4. Result of the variables of the VoiSS and QSHV protocols by sex in singers

Questionnaire	Gender				p-value
	Female		Male		
	Average	Median	Average	Median	
VoiSS					
Total	21.32	18.00	20.28	18.00	0.492
Impairment	10.75	9.00	11.38	10.00	0.862
Emotional	11.38	10.00	1.94	1.00	<0.042*
Physical	6.76	6.00	6.96	7.00	0.800
QSHV					
Total	26.15	28.00	26.57	28.00	0.764

*p<0.05 - Mann-Whitney test
Caption: VoiSS = Voice Symptom Scale; QSHV = *Questionário de Saúde e Higiene Vocal*

There was no correlation between the Brazilian validated version of VoiSS and QSHV domains (Table 5).

Table 5. Correlation of the variables of the VoiSS and QSHV protocols in singers

VoiSS	Total QSHV	p-value
	Correlation Coefficient (r)	
Total	0.076	0.300
Impairment	0.099	0.178
Emotional	-0.108	0.144
Physical	0.091	0.215

*p<0.05 - Spearman's Correlation Test
Caption: VoiSS = Voice Symptom Scale; QSHV = *Questionário de Saúde e Higiene Vocal*

DISCUSSION

Popular and classical singers perceive a vocal alteration differently due to the need for singing to be different in the two styles. Studies[6,12-15] pointed out that classical singers have a more acute perception of a vocal problem than popular singers. This is believed to occur because for classical singers, subtle changes in vocal quality may impair their professional vocal use, while in popular singers small vocal changes do not seem to impair the professional use of the voice because these characteristics are often part of the vocal signature of the singer.

It was found in this research that classical singers have been singing for longer than popular singers (Table 1). This seems to have occurred due to the greater demand for the musical style practiced by classical singers, which requires specific phonatory adjustments. In classical singing, there is a need for high vocal complexity to perform the works to be sung, demonstrating that these singers need more refined technique, requiring accompaniment by singing teachers at various moments in their careers and musical training[16,17]. The same does not happen with popular singers who perform different musical genres, with different adjustments and close to the speech production without necessarily having a formal vocal learning process. These singers commonly base their techniques on empirical knowledge and talent, and may consider musical training unnecessary[3,16,18]. Having vocal training through singing lessons allows the singer to develop the vocal mechanism, improve the quality of the singing voice, sing effortlessly, control aspects such as balanced vocal record exchange, variations in voice intensity, increased extension and modification of the anatomical configurations of the vocal tract[6].

Most classical and popular singers reported doing between 1 and 2 hours of shows a week (Table 2). Although the number of shows per week is small, most singers reported practicing daily singing for 1 to 2 hours, expanding the number of hours of vocal use during the week. The use of the voice for a long period in the shows, without the proper vocal training, can lead to the incorrect use of the voice and the practice of vocal abuse, which can increase the number of vocal complaints in the singers[5,6,16]. This data may justify the vocal complaints referred mainly by the learned singers found in this research, such as the presence of hoarseness and aphonia, although these data were not statistically significant.

A higher frequency of female singers, both popular and learned, was identified, however without difference (Table 2). The prevalence of singers is also found in other studies with singers[13,16,19]. In addition, the findings corroborate another study, in which the female gender is identified as more available to cooperate in research[20].

Data analysis related to the Brazilian validated version of VoiSS protocol showed higher scores in classical singers, in the total and emotional domains, than in popular singers (Table 3). This result, when compared according to sex, showed that female singers also obtained higher scores in the emotional domain (Table 4). The literature mentions that singers with complaints have more vocal symptoms and perceive greater disadvantage in singing because of their voice problem[12,21,22].

Another factor that may justify this finding is that women are more likely to develop vocal changes, which may be caused by frequent hormonal changes, by the predisposition of the laryngeal configuration and by the lower amount of hyaluronic acid, a bioactive glycosaminoglycan responsible for maintaining the ideal vocal fold viscosity[20,23], in the superficial layer of the lamina propria that the male sex[6].

The vocal complaint is important to detect the vocal handicap among both popular and classical singers[15,21,22]. The Brazilian validated version of VoiSS protocol is specific to identify vocal symptoms, contributing to a greater understanding of the common aspects of patients with vocal disorders, showing clinical responses to treatments for dysphonia[11,21,22]. Singers need this monitoring and, through the monitoring of vocal symptoms, the SLP will be able to perform early intervention, avoiding the reduction of vocal longevity of this professional.

Knowledge regarding vocal health and hygiene, identified by means of the QSHV protocol, did not present a statistically significant result. This may have happened because popular and classical singers reached scores above the cutoff point, which demonstrates that the two groups have a good knowledge of vocal health and hygiene. This finding was different from that found in other studies[5,6,24-27]. Campaigns to inform the population about habits that can compromise vocal health and voice care for singers have increased over the years; this fact may be related to the difference found between the surveys. It proves that the knowledge about vocal health and hygiene found in the singers can be high, but that does not mean that the singers of the present research have low perception of vocal symptoms, mainly in classical singers, which is evidenced by the absence of a relationship between knowledge about vocal health and hygiene and vocal symptoms (Table 5).

It was observed that most of the classical singers in this research did not have a smoking habit, with cigarette consumption found only in popular singers. One study[20] pointed out that singers, among four categories of voice professionals, had the lowest percentage of smokers. Considering the alterations generated by smoking, classical singers, as they are professionals with high vocal demand and high demand for refinement of vocal adjustments, could not be professionally committed to the practice of this habit.

The habit of drinking alcohol was more present in classical singers. This data is found in some studies[17,27], but other authors have also pointed out that popular singers are more adherent to this habit[6,20,23-25]. Habits vary widely among singers, and some may be characteristic of certain groups, varying according to the demands and requirements of each style.

The reason for seeking ENT care more frequently, among the group of singers studied was the presence of hoarseness, but symptoms of pain and aphonia were also reported, despite the fact that there was no statistical difference between the groups. Classical singers reported other symptoms, hoarseness and aphonia being the main factors. The literature corroborates this finding by describing that the most common symptoms in voice professionals are hoarseness, pain in the throat and loss of voice[4,5,6]. The ENT evaluation is important for the diagnosis of possible vocal fold injuries. These injuries can compromise vocal health and impair the professional performance of singers[5,6,16].

The demand for SLP treatment was very low in the studied group, with no difference for those who do not seek care and depending on the style. In another study[6], the authors reported that it is common to find singers who never sought specific help. In the sample studied, the demand for treatment due to changes in the voice was greater in classical singers, although without difference. The literature indicates that classical singers are more sensitive to changes in the voice[6,16,26], which may justify the demand for treatment in the group of this singing style. It is believed that classical singers seek assistance when they perceive minor vocal changes, while popular singers seek assistance when there are complaints more related to singing, such as difficulty in singing and difficulty in reaching high notes. The literature points out that popular singers, because they do not always seek technical musical knowledge and because they often have abusive vocal behavior, are more likely to develop vocal changes[4-7,13-15]. The singer who performs vocal training promotes many benefits to his vocal health and, with that, can prolong his professional career[6].

The descriptive analysis showed a higher frequency of self-rated singing voice, for the categories "excellent" and "very good" in classical singers, justifying the sharp vocal perception relevant to the style[6,16,27]. Popular singers self-rated their most frequently singing voices in the "good", "reasonable" and "bad" categories. This finding may be associated with the fact that popular singers have a higher occurrence of vocal complaints and living conditions that can lead to vocal strain, with fewer hours of rest and greater workload for using the voice[17,27].

A limitation of this study refers to the lack of knowledge of the musical sub-styles sung by the popular singers participating in this research, since the vocal adjustments differ in levels of difficulties and demands of the musculature. Research that analyzes classical singing with popular singing subdivided into its sub-styles will help to better understand vocal symptoms and the knowledge of health and vocal hygiene in these singers.

This study allowed us to better understand the perception that singers have regarding vocal symptoms and found that knowledge of vocal health and hygiene has been growing among singers, not differing according to styles and sex.

CONCLUSION

It is concluded that the perception of vocal symptoms was higher in classical singers as well as in female singers, with an impact on the emotional and total domain. The singers obtained a good degree of knowledge in vocal hygiene, not differing according to the styles of singing, classical and popular, and sex.

It is concluded that the perception of vocal symptoms was not related to the degree of knowledge of health and vocal hygiene in the studied singers.

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Authors contributions

JSC was responsible for data collection, analysis of results, writing and review of the manuscript; FM was responsible for designing the study, analyzing the results and revising the manuscript; CP was responsible for designing the study, analyzing the results and revising the manuscript; MB was responsible for designing the study, analyzing the results and final review of the manuscript.