

# Voice disadvantage in popular singers

## Desvantagem vocal em cantores populares

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### ABSTRACT

**Purpose:** Verify the association of sociodemographic, occupational, lifestyle and health characteristics with the vocal disadvantage of popular singers. **Methods:** Observational cross-sectional study with convenience sample composed of popular singers. The data collection was performed through a questionnaire with more than 21 questions, in addition to the protocol Modern Singing Handicap Index - MSHI. The Mann Whitney and Kruskal Wallis test were used. **Results:** The sample consisted of 57 singers, predominantly male, and the majority with age between 30 and 39 years. There was statistical significance between the total MSHI score and the variables: presence of more than one singer interposing the songs in the presentations, less time of profession, not realization of vocal quenching and self-perception of spoken voice as reasonable. **Conclusion:** Greater vocal disadvantage was verified in younger singers in the profession, who don't intercalate the songs with another singer, don't slow down the voice and perceive the spoken voice as reasonable.

**Keywords:** Voice; Singing; Quality of life; Occupational health; Speech therapy

### RESUMO

**Objetivo:** verificar a associação das características sociodemográficas, ocupacionais, de estilo de vida e saúde com a desvantagem vocal de cantores populares. **Métodos:** estudo observacional transversal com amostra de conveniência, composta por cantores populares. A coleta de dados foi realizada por meio de questionário com 21 perguntas, além do protocolo de Índice de Desvantagem para o Canto Moderno (IDCM). Foram utilizados os testes de Mann Whitney e Kruskal Wallis. **Resultados:** a amostra foi composta por 57 cantores, predominantemente do sexo masculino e com idade entre 30 e 39 anos. Houve significância estatística entre o escore total do IDCM e as variáveis: presença de mais de um cantor intercalando as músicas nas apresentações, menor tempo de profissão, não realização do desaquecimento vocal e autopercepção da voz falada como razoável. **Conclusão:** maior desvantagem vocal foi verificada em cantores mais novos na profissão, que não intercalam as músicas com outro cantor, não desaquecem a voz e percebem a voz falada como razoável.

**Palavras-chave:** Voz; Canto; Qualidade de vida; Saúde do trabalhador, Fonoaudiologia

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## INTRODUCTION

The voice is the main resource for a singer to work. A review study<sup>(1,2)</sup> identified a high prevalence of vocal disorders self-related between singers, mainly between popular singers, when compared to classical ones. Compared to individuals with low demand, a singer can have vocal alterations with more frequency<sup>(2,3)</sup>.

The term “popular sing” has been used to distinguish the classic sing from the erudite. A nonclassic music can be better nominated contemporary commercial music<sup>(4)</sup> to describe generically different types of music styles, for example popular brazilian music, rock, samba, pop, pagode, gospel, country and others.

Certain types of vocal disorders in popular singing can be noticed as a alteration, or considered as a more original and unique performance inside the context of contemporary commercial music<sup>(5)</sup>. The impact of the vocal problem in the singer can be seen by the perception of the disadvantage in singing, in other words, for the difficulty to keep the vocal quality, impacting the career<sup>(6)</sup>.

The high vocal demand in this population has three different levels of requirements, that can interfere in different ways in the singer. For the popular sing, the lack of formal training and singing technique can result in vocal disorders and this need to be investigated more<sup>(1)</sup>.

In order to have a fully knowledge about vocal health it is important to analyze the perspective that the individual has in relation to their quality of life, measuring how much it can be affected by the voice problem<sup>(7)</sup>. Self-perception can be considered as an indicator for the health status of singers.

The protocol, in vocal area used in this article, named Modern Singing Handicap Index - MSHI<sup>(5,8)</sup>, has the objective to determinate how the voice problem affects the life quality of the singer.

Research has shown that the use of generic self-assessment protocol identifies lower vocal disadvantage in their singers, when there is some specific information directed to singing, including the Modern Singing Handicap Index - MSHI. Thus, to assess the impact of the voice problem on the lives of singers, it is necessary to use the specific protocol for this group<sup>(9)</sup>.

Little is known about the factors that interfere in the vocal disadvantage of popular singers. Is important to understand how the behavior and habits, health and work conditions of these singers influence the perception of vocal disadvantage, for the interventions to promote vocal health and prevention of voice disorders, as well as the therapeutic management of this group.

The main point of this study was verify the association of the characteristics sociodemographic, behavioral, occupational and health issues with the vocal disadvantage of popular singers.

## METHODS

A observational cross-sectional analytical descriptive study with convenience sample composed of popular singers from both genders. Included in the study, were popular singers who were working in bars, concert halls, day and night festivals. Instrumental music bands, singers in bands with less than three persons and bands with just one style of music was not included in the study, in order to find professional with similar work activities. This standard was also used to investigate a group of

popular singers whose vocal demand included a diverse music style, for instance, rock, MPB, pop, samba, pagode, gospel, country and others. The Project was approved by the Reaserch Ethics Committee of the Universidade Federal de Minas Gerais according to the number 1.251.738.

Primarily, it was performed a search using websites of bands working in Belo Horizonte zone, then, the singers were contacted by phone to be informed about the study.

The pilot study was made to verify the singers understanding about the questions and the questionnaire, as identify the answer time, which was approximately 15 minutes.

A Informed Consent Form was sent via e-mail, and after confirming the interest in participating, the questionnaires were gave to the subjects. All participants signed the form. Two instruments were used: a questionnaire built by the own researchers, based on clinical experience and another study with singers<sup>(10)</sup> and the Modern Singing Handicap Index protocol, validated by Fussi and Fuschini<sup>(8)</sup>.

The questionnaire made by the researchers had 21 questions, with the following explanatory variables: a) sociodemographic: gender (male and female), age (19 to 29, 30 to 39, 40 to 49), singing as the main paid work activity (not, yes), performing another activity with the intense use of voice (no, yes); b) occupational: time of career as a singer (continuous variable), weekly rehearsal workload (continuous variable), number of performances performed throughout the month (continuous variable), more than one singer interleaving songs during performances (no, Yes), speech therapy follow-up to improve singing voice previously or currently (no, yes), current treatment for voice problems (no, yes), vocal warm-up (never, yes rarely, yes sometimes, yes often) and vocal cool-down (never yes rarely, yes sometimes, yes often); c) health: perception of spoken voice (excellent, very good, good, reasonable, poor), water intake during presentations (no, yes), amount of water per day (more than three liters, between two and three liters), less than two liters, never), symptoms of heartburn and poor digestion during or after performances (never, yes rarely, yes sometimes, yes often), drinking alcohol during shows (never, yes rarely, yes sometimes, yes often), physical activity per week (three or more times, once to twice, no time), upper respiratory tract infections (upper airway infections) (never, yes rarely, yes sometimes, yes often), and diagnosis of gastroesophageal reflux (GER) (no, yes).

The protocol MSHI<sup>(8)</sup>, translated to portuguese<sup>(5)</sup>, was applied and it consists in 30 questions spread in three subscales a) disability, which is linked to the functional aspect, related to the impact of the voice problem on professional activities; b) the disadvantage, related to the psychological impact of the voice problem; c) the defect, related to the organic aspect, related to the self-perception of the characteristics of the voice itself. The total MSHI score refers to the sum of the three subscales (disability, disadvantage and defect). Answers were scored on a 5-point Likert scale according to frequency of occurrence: 0 - never, 1 - almost never, 2 - sometimes, 3 - almost always, 4 - always. This protocol has three subscales: disability, disadvantage and defect, each with a maximum value of 40 points and the total score consists of the sum of the previous ones, with a maximum deviation of 120 points (total score). The higher the score, the greater the disadvantage perceived by the individual<sup>(11)</sup>.

A descriptive analysis from the data was made where the variables was represented in percentage. The variables profession time as singer (in years), rehearsal workload (in hours), number

of performances (last 30 days) were collected as continuous and then categorized for data analysis. Continuous variables related to the MSHI were represented by measures of central tendency.

As a response variable, the total MSHI score was used as a continuous variable to verify the association with the sociodemographic, occupational and health variables present in the questionnaire.

The association between the total MSHI score and the other explanatory variables was verified using the Mann Whitney test (for comparison of two groups) and Kruskal Wallis (for comparison of 3 or 4 groups).

A significance threshold of 5% (p value <0.05) was considered. After data collection, the results obtained were organized in a database created in an Excel spreadsheet. Analyzes were performed using STATA software (Stata Corporation, College Station, Texas), version 12.0.

## RESULTS

A total of 57 singers participated in the study, most of male gender (61.4%) and the predominant age range was between 30 and 39 years (40.4%). It was found that the highest mean was in defect subscale (organic domain) (7.4, ± 6.6) and the lowest, in the disadvantage subscale (emotional domain) (3.1, ± 4.5). The mean total MSHI score was 16.6 (± 15.4) (Table 1).

Doing this research it was found that 56.1% of the singers reported singing to be their main source of income and most had also done another activities with intense use of the voice (52.6%). In relation to the time of singing, predominantly those who had between 11 and 20 years of experience (49.1%). Regarding the workload of singer rehearsal, the majority was up to 2 hours per week (47.4%) And 45.6% of the singers had performed up to three presentations in the last thirty days (Table 2).

During the presentations, most singers were interspersing songs with others singers during the presentation (63.2%) and most of them replied that they often used their own equipment to sing (38.6%). Approximately 1/3 of the subjects had already performed speech-language monitoring to improve the singing voice (29.8%). Only 3.5% were doing treatment because of a voice problem (Table 2).

The singers who, “sometimes” or “often”, performed vocal warming exercises before the presentations accounted for 82.5%. Only 19.3% reported doing the vocal cool-down sometimes or frequently after the presentations (Table 2). There was a statistically significant association of the total in points of the IDCM with the following variables: some songs intercalated with another singer, shorter career time, not performing vocal cool-down exercises.

Regarding voice self-perception, most participants reported considering the spoken voice as good (38.6%). The singers who perceived the spoken voice as reasonable presented higher mean of the total score of the MSHI. The mean total score indicated a

lower vocal disadvantage, while the vocal self-perception was becoming positive (Table 3).

Singers who would ingest water during the shows were reported frequently (91.2%), but in a reduced quantity, i.e. 52.6% consumed less than 2 liters per day. It was also observed that 3.5% of the singers never drink water and that 68.4% never or rarely consume alcoholic beverages during presentations. More than 2/3 participants (59.6%) reported practicing regular physical activities. Regarding the presence of IVAS, 66.7% never or rarely presented any signs and/or symptoms. It was predominant the report of 91.2% of the singers who never or rarely felt heartburn and/or poor digestion, during or after the presentations and 73.7% had no diagnosis of GER. (Table 3).

## DISCUSSION

The singers of the present study presented high vocal disadvantage in the popular singing. The mean total score of the vocal disadvantage among the participating singers (16.6) was higher than the result in another study with classical (8.6) and popular singers (10.6), both without vocal complaint<sup>(11)</sup>. This difference was expected, since the singers of this research were not selected whether or not they had presented a voice complaint. Moreover, the results showed that the majority of the singers exercised another remunerated activity, with intense use of the voice, which indicates greater vocal demand and a greater chance of causing vocal disturbances.

The scale with the highest prejudice was related to the defect subscale (7.4), referring to the organic aspect. These findings confirm the data obtained by another study with singers of Brazilian popular music college choirs<sup>(5)</sup>, a study with choir singers from catholic and evangelical churches<sup>(12)</sup> and a study with popular singers, comparing two groups, with and without Vocal training<sup>(2)</sup>. The diversity of singing styles, vocal education and occupational demand seem to contribute to the variability in the alternation prevalence of self-reported voice<sup>(1)</sup>. The vocal disadvantage in singers can be interpreted as lack of technical knowledge, greater vocal demand and short experience in singing<sup>(5,13,14)</sup>.

The results of the present study confirmed the greatest vocal disadvantage in singers with the least experience in the popular singing. A early stage in the career, as a popular singer, can predispose to a shorter time of vocal awareness and formal training to cope with the work demand. One study<sup>(15)</sup> found that, the longer the time of experience in singing, the lower the vocal disadvantage measured by the Classical Vocal Handicap Index (IDVCC). Other studies have found that the correlation between the time in the profession, the total score<sup>(16)</sup> and the three subscales of the MSHI<sup>(9)</sup> was negative, that is, there is a greater vocal disadvantage among singers with shorter career period. On the other hand, other studies did not find a significant statistically association in the correlation between career time

**Table 1.** Description of subscales and total score of the Modern Singing Handicap Index

Variable	Average	Standard deviation	Median	Minimum	Maximum
Disability	6.1	6.1	4	0	30
Disadvantage	3.1	4.5	2	0	21
Defect	7.4	6.6	6	0	30
Total Score	16.6	15.4	13	0	69

**Table 2.** Description of working characteristics of popular singers and association with the Modern Handicap Singing Index

Variables		n	%	Average	Standard deviation	Median	P Value
Gender	Male	35	61.4	17.7	15.9	13	0.538
	Female	22	38.6	14.9	14.9	13	
Age	19 to 29	22	38.6	19.2	17.6	15	0.477
	30 to 39	23	40.3	15.4	13.4	13	
	40 to 49	12	21.1	14.2	15.6	9.5	
Singing as the main paid activity	No	25	43.9	16.5	14.8	13	0.803
	Yes	32	56.1	16.7	16.1	13.5	
Other vocal activity	No	27	47.4	14.8	13.8	11	0.565
	Yes	30	52.6	18.2	16.9	15	
Career time (in years)	0 to 10	23	40.4	20.9	14.6	19	0.014*
	11 to 20	28	49.1	14.7	15.5	11.5	
	21 to 30	6	10.5	9	16.3	2.5	
Rehearsal Hours (in hours)	0 to 2	27	47.4	13.1	11.4	10	0.403
	3 to 5	18	31.6	19.9	19.6	14.5	
	6 to 25	12	21.0	19.4	16	15	
Nubers of presentation (less 30 days)	1 to 3	26	45.6	17	18	12	0.864
	4 to 7	17	29.8	15.4	13.2	11	
	8 to 25	14	24.6	17.2	13.7	17.5	
Rotation with another singer	Yes	36	63.2	13.3	14.1	10	0.013**
	No	21	36.8	22.2	16.4	20	
Own equipment	Never	10	17.6	10.8	9.2	9	0.328
	Yes, rarely	8	14.0	12	10.4	13	
	Yes, sometimes	17	29.8	16.8	15.6	12	
	Yes, often	22	38.6	20.8	18.3	16.5	
Speech therapy follow-up for singing voice	No	40	70.2	16.6	15.7	11.5	0.619
	Yes	17	29.8	16.6	15.4	15	
Current treatment for vocal disorder	No	55	96.5	15.7	14	12	0.193
	Yes	2	3.5	42	38.2	42	
Vocal warming	Never	4	7.0	8.5	9.9	6.5	0.572
	Yes, rarely	6	10.5	19	25	12.5	
	Yes, sometimes	22	38.6	18.4	14.6	14	
	Yes, often	25	43.9	15.7	14.5	15	
Vocal cool-down	Never	24	42.1	18.4	19.1	14	0.037*
	Yes, rarely	22	38.6	18.9	13	16	
	Yes, sometimes	7	12.3	4.6	4.5	3	
	Yes, often	4	7.0	14.3	5	13	

\*Kruskal Wallis test significant in 5%; \*\*Mann Whitney test significant in 5%

Subtitle: n= number of subjects

and vocal disadvantage of lyrical and popular singers<sup>(17)</sup> and Church Singers<sup>(12)</sup>

The results of this study also showed that singers who do not alternate the songs with another singer, during the shows, have a greater vocal disadvantage, in relation to the singers who alternate. These results are similar to another study, which compared the vocal behavior of an individual vocal performance with a vocal performance shared with other singers<sup>(18)</sup>. This behavior allows the singer to perform a partial vocal rest during the presentations, which provides better vocal health.

In the present study, it was also perceived that the singers who did not have the habit of cool-down the voice, after the musical performances, presented a larger vocal disadvantage. It was found that the average of the total score of the MSHI was lower among the singers who reported to cool-down the voice sometimes, or often. Another study found 21 popular singers and 13 lyrical singers, who never performed vocal

cool-down<sup>(17)</sup>. It is noteworthy that a large number of popular singers participating in this study performed vocal warming sometimes, or often. Both warm-up and vocal cool-down are important, because these procedures can provide conditions for singers to be able to perform vocal adjustments without impairing their professional life<sup>(14,19,20)</sup>. The personalized vocal warming and cool-down provide the popular singer with greater vocal flexibility, allowing the exploitation, in a healthy way, of their traits and vocal identity<sup>(14)</sup>.

The singers who self-perceived the spoken voice as reasonable, presented higher vocal disadvantage in the popular singing, when compared to the other interviewees with a more positive evaluation of the voice. The spoken voice and the sung voice have different realities, but this result indicates a relationship between them. The spoken voice occurs naturally, unconsciously, and usually the speaker exposes what he thinks. The sung voice is usually presented consciously and vocal improvement



**Table 3.** Description of lifestyle and health characteristics of popular singers and association with the Modern Handicap Singing Index

Variables		n	%	Average	Standard deviation	Median	P value
Spoken voice perception	Excelent	14	24.5	8.6	12.1	4	0.009*
	Pretty good	18	31.6	15	10.7	14	
	Good	22	38.6	18.6	12.2	16.5	
	Moderate	3	5.3	48.7	33.5	67	
Water intake during presentations	No	5	8.8	13	3	13	0.933
	Yes	52	91.2	16.9	16.1	13.5	
Amount of water (in liters) per day	> 3	6	10.5	15.8	16.4	10.5	0.394
	From 2 to 3	19	33.3	14.1	14.4	11	
	< 2	30	52.6	18.9	16.3	15	
Alcohol intake	Never	2	3.6	8	11.3	8	0.336
	Yes, rarely	32	56.2	16.2	15.7	12	
	Yes, sometimes	7	12.3	11.4	15.2	4	
	Yes, often	10	17.5	19.3	19	18.5	
Physical activity (per week)	≥ 3	8	14.0	19.3	10.4	17.5	0.87
	1 a 2	21	36.8	17.6	19.2	13	
	None	13	22.8	17.4	14.2	12	
Upper airway infection	Never	23	40.4	15.3	12.6	15	0.226
	Yes, rarely	13	22.8	12.8	14.7	6	
	Yes, sometimes	25	43.8	15.3	14	12	
	Yes, Often	16	28.1	19.6	18.3	17	
Gastroesophageal reflux	No	3	5.3	27.3	13.7	25	0.404
	Yes	42	73.7	15.9	15.8	11.5	
Symptoms of heartburn	Never	15	26.3	18.6	14.8	15	0.304
	Yes, rarely	45	78.9	15.2	15	12	
	Yes, sometimes	7	12.3	19.3	17.5	13	
	Yes, often	4	7.0	27	18.5	29	
		1	1.8	20	.	20	

\*Kruskal Wallis test significant in 5%

Subtitle: n = number of subjects

is necessary due to the needs of different musical styles, and popular music is considered the most spontaneous style and without predetermined rules<sup>(21)</sup>.

A study that aimed to evaluate vocal parameters related to voice perception spoken by the singers found that only one participant perceived impairment in vocal quality. The positive perception of the quality of the spoken voice decreases the probability of reporting changes related to organic issues in the sung voice<sup>(22)</sup>. In a study with choralists, there was statistical significance between the absence of symptoms in the spoken voice and the good perception of voice quality in speech by the singers<sup>(23)</sup>. The perception of vocal disorder in the spoken voice of popular singers may indicate difficulties and losses also in the singing voice, both of which need to be considered and evaluated during the speech therapy<sup>(24)</sup>.

It is important to know the behavior and vocal habits of the popular singers, so that it is possible a orientation and awareness speech therapy work about voice care and, consequently, conservation of vocal health. Most singers reported good general health, regarding the presence of IVAS, heartburn symptoms and GERD diagnosis. Authors have mentioned the irregular vibration of the vocal folds mucosal as one of the impairments caused by acid reflux in GERD patients, which would justify the dysphonia presented by these patients<sup>(25,26)</sup>. Upper airway infections may contribute to or increase vocal misuse, once the alterations cause the use of the voice to take

place in inappropriate conditions, that is, in the presence of resected mucous membranes, edema and vocal tract irritation<sup>(27)</sup>. Despite the consequences of such morbidities on the voice, the presence of these among the singers did not influence the perception about the vocal disadvantage in the singing.

Healthy habits, such as the regular practice of physical activity and no ingestion of alcoholic beverages during the presentations were frequent reports among the participants.

The present study found that there was good hydration during the presentations with the singers, however, the daily amount of water intake reported by the majority was less than two liters. This quantity is considered insufficient, despite the lack of scientific evidence about the amount of ideal water to be consumed daily, in order to maintain the laryngeal hydration. It is known that the well hydrated larynx favors the lower pressure of air on the vocal folds to initiate phonation, reducing the level of phonation pressure and vocal fatigue. Moreover, the friction between the vocal folds resulting from the throat and the cough can be avoided<sup>(28)</sup>.

Despite the small number of participants in this study and the impossibility of generalizing the results for the population of popular singers, the results brought contributions on the vocal disadvantage and its relationship with aspects of work and technical training for singing. Some attitudes, such as merging songs with another singer and performing vocal warming and de-warming, besides adequate daily hydration, can reduce the

impact of the voice problem in the professional activities of the singers.

The speech-language pathology intervention can minimize the alterations and also has a preventive nature, thus helping professionals dependent on their voice to take care of their work instrument<sup>(29)</sup>, which leads to thinking about the longevity of the singers' careers, decreasing the risks of possible vocal alterations<sup>(10)</sup>.

Further research is expected to be developed in order to investigate aspects related to the popular singing, encompassing not only the singer's voice, but also the emotional, social, work and vocal wellbeing habits. The greatest knowledge about the singing voice and the peculiarities of each musical style is fundamental for speech therapy, as it will allow the development of integral and specialized conduct.

## CONCLUSION

Popular singers show vocal disadvantage in singing, especially in the organic aspect (defect subscale). The greatest vocal disadvantage appeared among those who do not intercalate songs with another singer during the performances, those with shorter career time, who do not cool-down the voice and who perceive the spoken voice as reasonable.

Habits such as warming up the voice before performances and cooling down, increasing water consumption, and interleaving songs with another singer are strategies that can minimize vocal disadvantage in popular singers.

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