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Correlation between vocal handicap and quality of life of popular singers

Correlação entre desvantagem vocal e qualidade de vida de cantores populares

Keywords

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Singing
Speech Therapy
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Voice

Descritores

Qualidade de Vida
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ABSTRACT

Purpose: To evaluate the correlation between vocal handicap index and the quality of life of popular singers. **Methods:** Transversal study. The data was collected through personal interviews and the use of the following instruments: World Health Organization Quality of Life-bref (WHOQOL-bref), the Modern Singing Handicap Index (MSHI) and a questionnaire about the singer's sociodemographic profiles and their self-perceived complaints. The level of significance was 5% ($p < 0.05$). A descriptive analysis of the WHOQOL-bref and the IDCM scores was done using absolute and relative frequencies, mean and standard deviation. Quantitative variables were tested with Komolgorov-Smirnov, using non-parametric tests Kruskal Wallis and U Mann-Whitney. Correlation between the WHOQOL-bref and MSHI instruments was made with Spearman's Correlation Test. Reliability of the instruments tested by Cronbach's Alpha test. **Results:** Sample of 206 popular singers who were mostly man, single, with higher education or postgraduate and income of up to six minimum wages a month. Majority of them had high scores in WHOQOL-bref, indicating self-perception of good quality of life. Most singers report vocal complaints. The ones without vocal complaints showed self-perception of a better quality of life and lower vocal handicap with meaningful statistical significance in all WHOQOL-bref domains and MSHI subscales. Singers over 40 years old and with higher incomes showed better perception of their quality of life and lower vocal handicap. There was negative or weak correlation between the MSHI and the WHOQOL-bref. **Conclusion:** Better quality of life had correlation among the group with lower vocal handicap.

RESUMO

Objetivo: Avaliar a correlação entre o índice de desvantagem vocal e a qualidade de vida de cantores populares. **Método:** Estudo transversal realizado com cantores populares. Os dados foram coletados por entrevistas presenciais, com aplicação dos instrumentos *World Health Organization Quality of Life-bref (WHOQOL-bref)*, Índice de Desvantagem para o Canto Moderno (IDCM) e questionário de perfil sociodemográfico e de autopercepção de queixas. O nível de significância foi de 5% ($p < 0,05$). Realizou-se análise descritiva por meio de frequências absolutas e relativas, média e desvio padrão. Variáveis quantitativas testadas por teste *Komolgorov-Smirnov* e testes não paramétricos *Kruskal Wallis* e *U Mann-Whitney*. A correlação entre os instrumentos *WHOQOL-bref* e IDCM foi realizada pela correlação de *Spearman*, a confiabilidade dos instrumentos foi testada pelo *Alpha de Cronbach*. **Resultados:** Amostra composta por 206 cantores populares. Eles eram, em maioria, homens, solteiros, com escolaridade superior ou pós-graduação e renda de até seis salários mínimos. A maioria teve escores altos no *WHOQOL-bref*, indicando autopercepção de boa qualidade de vida. A maior parte dos cantores declarou ter queixas vocais. Aqueles que não apresentaram queixas tiveram autopercepção de melhor qualidade de vida e de menor desvantagem vocal, com significância estatística para todos os domínios do *WHOQOL-bref* e subescalas do IDCM. Cantores com melhores rendas e com faixa etária acima de 40 anos apresentaram melhor autopercepção de qualidade de vida e de menor desvantagem vocal. Houve correlação negativa e fraca entre o IDCM e o *WHOQOL-bref*. **Conclusão:** Melhor qualidade de vida teve correlação com menor desvantagem vocal.

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INTRODUCTION

Popular singers have been referred to in the literature as professionals with a high prevalence of dysphonia and self-perceived vocal handicap^(1,2). The approach about singers with vocal changes, according to the current models of health care, has sought to investigate the self-perception of individuals about their health and quality of life and for this reason, they focus their attention on the individual and not on the diseases presented. Thus, health care must gravitate towards people's needs and focus on their quality of life and health, which is seen as a state of complete physical, mental and social well-being, and not simply as the absence of disease⁽³⁾.

The development of instruments capable of measuring people's self-perception of quality of life allows an investigation of the aspects that involve the different dimensions of the human being, makes it possible to evaluate the effectiveness of treatments, and can guide the development of health policies⁽⁴⁾.

Quality of life is defined by the World Health Organization (WHO) as a concept that encompasses a multidimensional and subjective perspective that contemplates the complex relationship between physical and psychological health, level of independence, social relationships, personal beliefs, and the environment in the quality of life⁽³⁾.

In the case of people who have complaints of vocal changes, it is important to find out which dimensions of their quality of life are related to these problems. This is because the self-perception of vocal changes and their relationship with quality of life depends on the level of need for a voice adapted for social and professional use, the required vocal refinement, and the degree of impact of a voice problem on the success of the professional performance of the subjects⁽⁵⁾.

The 2004 National Consensus on Professional Voice emphasizes the importance of care, awareness of the limits and abuses in the singing voice, and the adequate vocal qualification for popular singers. These aspects are important because the voice is fundamental for the exercise of singing and the maintenance of income⁽⁵⁾. However, not always popular singers who have vocal complaints and are exposed to unhealthy conditions during their professional performance may not realize the impact of these changes on their quality of life⁽⁶⁾.

Considering the quality of life from a multidimensional perspective in its construct, we believe in the relevance of investigating, in addition to the self-perception of vocal changes, the general quality of life of popular singers. The study of the correlation between the vocal handicap of popular singers and their quality of life can favor the understanding of the behavior of the variables involved, to guide health care programs and direct actions to improve the vocal quality and life of this population.

To investigate the self-perception of the vocal handicap of popular singers, there is a specific protocol, which is sensitive to the mapping of vocal problems, the Handicap Index for

Modern Singing (MSHI), which has been translated and adapted to Brazilian Portuguese^(7,8).

MSHI is a vocal self-assessment instrument that aims to quantify and qualify a problem in the singing voice, in addition to providing a mapping of vocal problems in popular singers and indicating paths for rehabilitation^(7,8). Studies carried out with the MSHI have made it possible to verify variables that are related to greater vocal handicaps. The instrument consists of thirty questions that include the subscales Disability, Handicap, and Defect, corresponding, respectively, to the functional, emotional, and organic domains^(7,9).

Research in which the MSHI was used, found that the length of experience of the popular singer was related to less vocal handicap⁽⁸⁾. Research with solo amateur church singers concluded that they have few vocal complaints and that, when present, impact only on singing activity and vocal changes do not affect their voice-related quality of life⁽¹⁰⁾. Another study concluded that singing lessons seem to minimize vocal handicap for amateur singers in church choirs⁽¹¹⁾. Popular singers have a lower perception of vocal problems and vocal handicaps when compared to singers of the classical genre⁽¹²⁾.

There are several instruments used by the scientific community to investigate the quality of life. Among them, the World Health Organization Quality of Life-Bref (WHOQOL-Bref) has a cross-cultural focus. This instrument was chosen to investigate the quality of life in this study because it is sensitive, easy, and quick to apply, allows the identification of vulnerable groups, describes the population's quality of life profile, and is based on the Organization's quality of life construct World Health Organization (WHO)^(4,13).

The objectives of this research were to investigate the correlation between the vocal handicap index and the quality of life of popular singers, in addition to comparing the averages of the WHOQOL-Bref and MSHI instruments, according to sociodemographic variables and the presence of vocal complaints. It is hoped, with this, to contribute to the advancement of research in Speech-Language Therapy, which involves the singing voice.

METHODS

The research was approved by an Ethics Committee on Research with Human Beings, under opinion 1,745,267. This is a cross-sectional study. The search for popular singers was done through social networks and personal contacts of the researcher, who is also a singer. The popular singers who constituted the sample were those who actively sang in bars, theaters, and music festivals in the city, who were exclusively singers or had another profession, besides singing. Non-probabilistic sampling for convenience and the snowball method was used, in which the singers themselves indicated new participants.

Popular singers with or without vocal complaints were included; to sing popular music; of both genders and those aged between 18 and 60 years old. We excluded singers with a

performance time of less than one year and those who worked exclusively as choristers or in vocal groups.

The researcher conducted the interviews between October 2016 and August 2017, with the support of two academics from the last semester of a Speech-Language Therapy course, trained and qualified to contact and explain the purpose of the research to the singers, schedule the interviews, apply the questionnaires and store them safely until weekly delivery.

Initially, the singers were contacted in person, by phone, or on social media. The interviews with the singers were scheduled in private places and according to their preferences. The participants were informed about the research procedures, had their doubts resolved, and were invited to participate in the study. Then, they confirmed their acceptance by signing the Informed Consent Form. Only the interviewer and the participant were present during the interviews, which were carried out in an average time of forty minutes. The questionnaires were self-administered and the instruments were filled out according to the instructions contained in the application manual.

The instruments used for data collection were the WHOQOL-Bref⁽⁴⁾, the MSHI⁽⁷⁾, and the sociodemographic questionnaire, which is part of the first part of the WHOQOL-Bref (plus a question about self-perception of vocal complaints), applied in the following order: sociodemographic questionnaire, WHOQOL-Bref⁽¹⁴⁾ and MSHI⁽⁷⁾. At the end of the interview, contacts were requested from other singers, possible research participants.

The sociodemographic questionnaire collected data related to gender, age group, education, marital status, and total income of popular singers, plus a question about self-perception of vocal complaints.

The WHOQOL-Bref instrument is a questionnaire that investigates how the participant feels about his quality of life, health, and other areas of his life. The instrument consists of twenty-six questions divided into four domains: Physical, Psychological, Social Relations, and Environment, in addition to two general issues of quality of life. The questions represent each of the twenty-four facets of six domains that make up the original instrument, the WHOQOL-100. Thus, while in the WHOQOL-100, each of the 24 facets is evaluated based on 4 questions, in the WHOQOL-Bref each facet is evaluated by only one question⁽¹⁴⁾.

The facets of the Physical domain of the WHOQOL-100 instrument include questions about pain and discomfort; energy and fatigue; sleep and rest. The Psychological domain is composed of the facets: positive feelings; thinking, learning, memory, and concentration; self-esteem; body image and appearance; negative feelings. The Level of Independence domain, due to its facets: mobility; activities of daily living; dependence on medication or treatments. The Social Relations domain, composed of the questions: personal relationships; social support; sexual activity. The Environment domain addresses the facets: physical security and protection; home environment; financial resources; health and social care: availability and quality; opportunities to acquire new information and skills; participation in/and opportunities

for recreation and leisure; physical environment (pollution, noise, traffic, climate); transport. Finally, the domain Spiritual Aspects/religion/personal beliefs refer to the facet: spirituality/religion/personal beliefs⁽³⁾.

In representation of the facets of the WHOQOL-100 instrument, the Physical domain of the WHOQOL-Bref is related to the issues: pain and discomfort; energy and fatigue; sleep and rest; mobility; activities of daily life; dependence on medication or treatments; work capacity. The Psychological domain addresses issues related to positive feelings; thinking, learning, memory, and concentration; self-esteem; body image and appearance; negative feelings; spirituality/religion/personal beliefs. The Social Relations domain covers issues related to personal relationships; social support and sexual activity. The Environment domain refers to physical security and protection; the home environment; financial resources; the availability and quality of health and social care; opportunities to acquire new information and skills; participation and opportunities in recreation and leisure; the Physical environment (pollution/noise/traffic/climate); transport⁽¹⁴⁾.

WHOQOL-Bref questions are scored on a positive direction scale, that is, higher values indicate better quality of life. The answers to the questions are obtained by a five-point Likert scale, with a score ranging from 1 to 5. In some questions such as “how satisfied are you with your health?”, the answers are marked according to the Likert scale, in a positive direction: very dissatisfied (1), dissatisfied (2), neither satisfied nor dissatisfied (3), satisfied (4) and very satisfied (5). In others, such as “To what extent do you think your physical pain prevents you from doing what you need?: nothing (1), very little (2), more or less (3), a lot (4), and extremely (5), there is a need to convert questions to scale in a positive direction. These scores are scaled from 0 to 100^(3,14).

The domain scores for the WHOQOL-Bref are calculated by taking the average of all items included in each domain and multiplying by a factor of four, to make the results of the domain comparable with the scores used in the WHOQOL-100^(3,14).

The MSHI is an instrument that assesses the vocal handicap perceived by the singer and consists of thirty items. It covers the Disability, Handicap, and Defect subscales that correspond, respectively, to the Functional, Emotional, and Organic domains, each containing ten items. The answers, in each subscale of ten items, are marked on a five-point Likert scale according to the frequency of occurrence: (0) never, (1) rarely, (2) sometimes, (3) almost always, and (4) always. The maximum score for each subscale is 40 points. The total score is made up of the sum of the previous scores and the maximum score is 120 points. The higher the score, the greater the handicap perceived by the individual⁽⁷⁾.

The defect is any loss or abnormality, be it psychological, physiological, anatomical or structural, temporary or permanent⁽⁹⁾. Issues related to the Defect subscale include problems with breathing control; variation in vocal performance; the presence of air, weakness or hoarseness in the voice; need to force the voice in the presentations; unpredictable vocal performance; need to change the voice during the presentations; feeling of

difficulty in singing; tiredness and worsening of the voice at night⁽⁷⁾.

Disability is defined as any reduction or restriction in the ability to perform an activity expected for the individual, in their usual activities⁽⁹⁾. The issues related to the Disability subscale are: feeling of tired voice, from the beginning, or during, or after the shows; need to adjust techniques and repertoire according to the voice problem; difficulties during presentations and making two or more presentations in a row; the need for help from the sound operator to mask vocal and medication problems; limitation of the social use of the voice⁽⁷⁾.

The handicap is the result of Defect or Disability, characterized by the limitation or impediment in fulfilling an expected role for the individual and causes social, cultural, developmental, and economic consequences⁽⁹⁾. The issues related to handicap are anxiety before the presentations; incomprehension and criticism of people living together about the voice problem; change in mood, concern when repeating vocalizes or musical phrases; career concern; perception of colleagues, entrepreneurs, and critics of the vocal problem; canceling and not scheduling shows and limiting the use of social voice⁽⁷⁾.

There is no cut-off point or estimated mean scores for the WHOQOL-Bref^(3,14) and MSHI⁽⁷⁾ instruments.

For the statistical analysis, the data were tabulated in software and the statistical analysis was performed according to the SPSS syntax, to perform data verification, cleaning, and computation of the total scores, described in the WHOQOL-Bref user manual^(3,14).

The significance level of 5% ($p < 0.05$) was used. Descriptive analysis was performed, using absolute and relative frequencies, mean and standard deviation. In the quantitative variables, adherence to the normal curve (Kolmogorov-Smirnov test) was tested and as these were shown to be free of distribution, non-parametric tests were applied. The comparison of the means of the quantitative variables was performed using the Mann-Whitney and Kruskal Wallis tests. The correlation between WHOQOL-Bef and MSHI instruments was made by Spearman's Correlation⁽¹⁵⁾. In order to verify the reliability of the WHOQOL-Bref and MSHI instruments, Cronbach's Alpha test was performed⁽¹⁶⁾.

All comparisons were made between the subscales and the total MSHI score and WHOQOL-Bref domains, according to the variables of the sociodemographic profile and the presence of vocal complaints from the study participants and those that had statistical significance in both instruments.

RESULTS

The final sample consisted of 206 popular singers. Initially, we interviewed 215 singers and we excluded nine (three were under 18 years old, five were over 60 years old and one sang less than a year ago).

Most of the popular singers were men, single, with higher education or postgraduate education and income of up to six minimum wages. The age ranged from 18 to 58 years. Among the 206 singers, 90 (43.70%) were between 18 and 30 years

old, 53 (25.70%) between 31 and 40 years old and 63 (30.60%) were over 40 years old. Of the total, 131 (63.60%) were men.

Regarding their education, 6 singers (2.90%) reported having elementary education, 90 (43.70%) said they had high school and most of them (53.40%) had higher education or postgraduate education. The majority, 139 singers (67.50%), reported not having a partner. Regarding the total monthly income, 81 singers (39.30%) said they received from one to three minimum wages, 77 (37.40%) reported having an income of four to six minimum wages and 48 (23.30%) said they had an income of more than six minimum wages. Among the singers, 112 (54.40%) acknowledged having vocal complaints.

The internal validity of the WHOQOL-Bref instrument was 0.869, while the MSHI was 0.948, indicating high internal consistency for the WHOQOL-Bref and very high internal consistency for the MSHI⁽¹⁶⁾.

Concerning the general quality of life issues of the WHOQOL-Bef: "How would you rate your quality of life?" and "How satisfied are you with your health?", 79.6% of singers rated their quality of life as good or very good and 66.9% declared they were satisfied or very satisfied with their health.

Table 1 shows the mean scores of the WHOQOL-Bref and MSHI instruments for the entire sample of popular singers. The Psychological domain had the best score and the Environment was the domain with the worst score. As for the assessment of vocal handicap using the MSHI, the Defect subscale was the one with the highest score, that is, perception of the greatest vocal handicap, and the handicap subscale, which had the lowest score, which indicates the perception of the least vocal handicap.

The comparison of the averages of the WHOQOL-Bref and MSHI scores, according to the presence of vocal complaints, reveals a perception of a better quality of life and less vocal handicap for singers without vocal complaints, with statistical significance, for all domains of the voice. WHOQOL-Bref and subscales of the MSHI (Table 2).

Tables 3 and 4 show the comparison of the averages of the WHOQOL-Bref and MSHI scores, according to the income, age group, and marital status of popular singers. Although the mean scores for the variables "gender" and "education" were calculated, there was no significant difference in the comparison of these variables in the two instruments and, therefore, they did not compose the data in the Tables.

Singers with an income above six minimum wages, obtained higher averages (perception of a better quality of life) in all domains of the WHOQOL-Bref, with statistical significance. Singers over 40 years old obtained higher averages in the scores, in the Psychological, Social Relations, and Environment domains. Regarding the variable "marital status", the singers who claimed to have partners, had a higher average in the scores in the Environment domain of the WHOQOL-Bref (Table 3).

Singers with an income above six minimum wages had lower averages in the MSHI, in the subscales Handicap, Defect and total score of the MSHI, indicating self-perception of lower vocal

Table 1. Average scores of WHOQOL-Bref and MSHI instruments for all samples of popular singers. Data collected in 2018. n = 206

Instruments	n	Average	SD	Min	Max
WHOQOL-Bref					
Physical Domain	206	68.78	14.32	7.14	96.43
Psychological Domain	206	70.13	13.24	16.67	95.83
Social Relations Domain	206	69.34	17.14	0	100.00
Environment	206	60.82	13.19	18.75	96.88
MSHI					
Disability Domain	206	8.96	6.71	0	31.00
HandicapDomain	206	6.02	5.79	0	27.00
Defect Domain	206	10.90	7.95	0	34.00
Total MSHI	206	25.88	18.88	0	79.00

Caption: SD = standard deviation

Table 2. Comparison of the mean scores of the WHOQOL-Bref and MSHI instruments for the whole sample of popular singers, according to the presence of vocal complaints. Data collected in 2018. n = 206

Instruments	n	Average	SD	Min	Max	P value
WHOQOL-Bref						
Physical Domain						
no complaints	94	72.42	15.92	7.14	96.43	<0.01
with complaints	112	65.72	12.07	39.29	92.86	
Psychological Domain						
no complaints	94	75.13	12.06	41.67	95.83	<0.01
with complaints	112	65.92	12.76	16.67	91.67	
Social Relations Domain						
no complaints	94	73.23	15.93	25.00	100.00	<0.01
with complaints	112	66.07	17.50	0.00	100.00	
Environment						
no complaints	94	64.63	12.88	25.00	96.88	<0.01
with complaints	112	57.62	12.64	18.75	96.88	
MSHI						
Disability Domain						
no complaints	94	5.51	4.66	0.00	20.00	<0.01
with complaints	112	11.86	6.81	0.00	31.00	
HandicapDomain						
no complaints	94	3.60	4.68	0.00	27.00	<0.01
with complaints	112	8.06	5.85	0.00	26.00	
Defect Domain						
no complaints	94	6.06	5.29	0.00	27.00	<0.01
with complaints	112	14.96	7.54	3.00	34.00	
Total MSHI						
no complaints	94	15.17	13.17	0.00	72.00	<0.01
with complaints	112	34.88	18.28	5.00	79.00	

Mann-Whitney U test (p<0.05)

handicap. Those over 40 years old also obtained means of the lowest scores in the Handicap, Defect subscales and in the total MSHI score. These data indicate self-perception of less vocal handicap

on the part of singers with higher incomes and aged over 40 years old. Singers who declared they had companions had a less vocal handicap (lower scores) in the MSHI handicap subscale (Table 4).

Table 3. Comparison of the mean scores in the WHOQOL-Bref instrument, according to income, age group, and marital status of popular singers. Data collected in 2018. n = 206

Instrument/Variable		n	Average	SD	Min	Max	P value
WHOQOL-Bref							
Physical Domain							
Income	1 to 3 MW ^A	81	66.01	14.81	7.14	96.43	0.018
	4 to 6 MW ^B	77	68.60	13.49	39.29	96.43	
	> 6 MW ^{C; A; B}	48	73.74	13.71	35.71	96.43	
Age Group	18 to 30 years	90	68.18	13.50	35.71	96.43	0.416
	31 to 40 years	53	67.32	15.45	7.14	96.43	
	> 40 years	63	70.86	14.47	35.71	96.43	
Marital Status	No Companion	139	68.55	13.13	39.29	96.43	0.509
	With Companion	67	69.24	16.61	7.14	96.43	
Psychological Domain							
Income	1 to 3 MW ^A	81	68.16	12.90	37.50	91.67	0.002
	4 to 6 MW ^B	77	68.18	14.43	16.67	91.67	
	> 6 MW ^{C; A; B}	48	76.56	9.44	54.17	95.83	
Age Group	18 to 30 years	90	68.33	12.84	37.50	91.67	0.001
	31 to 40 years	53	67.37	13.40	16.67	91.67	
	> 40 years	63	75.00	12.52	37.50	95.83	
Marital Status	No Companion	139	69.99	13.27	37.50	95.83	0.895
	With Companion	67	70.40	13.26	16.67	95.83	
Social Relations Domain							
Income	1 to 3 MW ^A	81	66.77	18.19	0.00	100.00	0.027
	4 to 6 MW ^B	77	68.72	16.34	33.33	100.00	
	> 6 MW ^{C; A; B}	48	74.65	15.66	25.00	100.00	
Age Group	18 to 30 years	90	70.19	16.14	0.00	100.00	0.005
	31 to 40 years	53	63.05	18.74	25.00	100.00	
	> 40 years	63	73.41	15.83	25.00	100.00	
Marital Status	No Companion	139	70.68	16.98	0.00	100.00	0.045
	With Companion	67	66.54	17.26	25.00	100.00	
Environment Domain							
Income	1 to 3 MW ^A	81	55.21	12.26	18.75	84.38	< 0.001
	4 to 6 MW ^B	77	60.19	11.35	37.50	90.63	
	> 6 MW ^{C; A; B}	48	71.29	11.31	53.13	96.88	
Age Group	18 to 30 years	90	57.75	12.96	18.75	84.38	< 0.001
	31 to 40 years	53	58.20	10.53	40.63	90.63	
	> 40 years	63	67.41	13.33	28.13	96.88	
Marital Status	No Companion	139	59.15	13.07	18.75	96.88	0.014
	With Companion	67	64.28	12.85	34.38	96.88	

Tests: Kruskal Wallis (p<0.05) and U- Mann Whitney (p<0.05)

Caption: SD = standard deviation; MW = minimum wages (R\$ 937.00); equal letters indicate the existence of significant difference by the Mann Whitney U Test

There was a negative and weak correlation between the MSHI subscales and all domains of the WHOQOL-Bref instruments, except between the scores of the Social Relations domains and all the subscales of the MSHI and between the Environment domain and the Disability subscale of the MSHI, which were

insignificant. The weakest correlation ($r=0.236$) was between the WHOQOL-Bref Social Relations domain and the MSHI Disability subscale and the strongest correlation ($r=0.412$) was between the WHOQOL-Bref Physical domain and the total MSHI score. These results are shown in Table 5.

Table 4. Comparison of the mean scores on the MSHI instrument, according to income, age group, and marital status of popular singers. Data collected in 2018. n = 206

Instrument/Variable		n	Average	SD	Min	Max	P value
MSHI							
Disability Subscale							
Income	1 to 3 MW ^A	81	9.53	6.23	0.00	25.00	0.217
	4 to 6 MW ^B	77	9.18	7.47	0.00	31.00	
	> 6 MW ^{C; A; B}	48	7.65	6.13	0.00	25.00	
Age Group	18 to 30 years	90	9.16	6.80	0.00	30.00	0.054
	31 to 40 years	53	10.6	7.42	0.00	31.00	
	> 40 years	63	7.30	5.58	0.00	21.00	
Marital Status	No Companion	139	9.45	6.78	0.00	30.00	0.110
	With Companion	67	7.94	6.49	0.00	31.00	
Handicap Subscale							
Income	1 to 3 MW ^A	81	6.49	5.08	0.00	20.00	0.03
	4 to 6 MW ^B	77	6.30	6.27	0.00	27.00	
	> 6 MW ^{C; A; B}	48	4.79	6.04	0.00	25.00	
Age Group	18 to 30 years	90	6.48	5.12	0.00	21.00	0.011
	31 to 40 years	53	6.72	6.45	0.00	27.00	
	> 40 years	63	4.79	6.00	0.00	26.00	
Marital Status	No Companion	139	6.60	5.94	0.00	27.00	0.019
	With Companion	67	4.82	5.29	0.00	25.00	
Defect Subscale							
Income	1 to 3 MW ^A	81	12.37	7.88	0.00	34.00	0.002
	4 to 6 MW ^B	77	11.35	8.32	0.00	31.00	
	> 6 MW ^{C; A; B}	48	7.69	6.58	0.00	28.00	
Age Group	18 to 30 years	90	11.61	7.92	0.00	31.00	0.001
	31 to 40 years	53	13.11	8.34	0.00	34.00	
	> 40 years	63	8.02	6.86	0.00	26.00	
Marital Status	No Companion	139	11.43	8.12	0.00	34.00	0.145
	With Companion	67	9.79	7.52	0.00	29.00	
Total							
Income	1 to 3 MW ^A	81	28.4	17.71	0.00	70.00	0.023
	4 to 6 MW ^B	77	26.83	20.27	0.00	79.00	
	> 6 MW ^{C; A; B}	48	20.13	17.59	0.00	76.00	
Age Group	18 to 30 years	90	27.24	18.39	1.00	79.00	0.005
	31 to 40 years	53	30.43	20.59	0.00	76.00	
	> 40 years	63	20.11	16.82	0.00	67.00	
Marital Status	No Companion	139	27.49	19.23	0.00	79.00	0.071
	With Companion	67	22.55	17.80	0.00	76.00	

Tests: Kruskal Wallis (p<0.05) and U- Mann Whitney (p<0.05)

Caption: SD = standard deviation; MW = minimum wages (R\$ 937.00); equal letters indicate the existence of significant difference by the Mann Whitney U Test

Table 5. Correlation between WHOQOL-Bref and MSHI instruments. Data collected in 2018. n = 206

Instrument		MSHI Subscales			
		Disability	Handicap	Defect	Total MSHI
WHOQOL-Bref domains					
r	Physical	-0.366	-0.394	-0.372	-0.412
		p	<0.001	<0.001	<0.001
		n	206	206	206
r	Psychological	-0.359	-0.359	-0.375	-0.407
		p	<0.001	<0.001	<0.001
		n	206	206	206
r	Social relationships	-0.236	-0.229	-0.259	-0.276
		p	<0.001	<0.001	<0.001
		n	206	206	206
r	Environment	-0.254	-0.319	-0.35	-0.338
		p	<0.001	<0.001	<0.001
		n	206	206	206

Spearman correlation

Caption: r = strength of the correlation; p = p value; n = number of subjects in the sample

DISCUSSION

The popular singers reported being satisfied or very satisfied with their health, rated their quality of life as good or very good. The WHOQOL-Bref quality of life scores were high, except the Environment domain. The vocal handicap index had a negative and predominantly weak correlation with the singers' quality of life. Singers who declared they had vocal complaints had a perception of worse quality of life.

The multidimensionality of the human being must be considered in the construct of quality of life and health, so as not to overestimate or underestimate the existence of a vocal handicap. The study also indicates the importance of observing other health determinants, which contribute to the self-perception of quality of life and health^(17,18).

In this research, we observed that the Environment domain had the lowest score in the WHOQOL-Bref, both for singers with vocal complaints and those without complaints. Aspects of this domain are related to health determinants⁽¹⁷⁾ that influence self-perception of well-being⁽¹⁹⁾. We observed that many of them refer to policies that include security, transportation of financial resources, recreation, leisure, among others, which are not directly within the reach of health professionals and deserve attention by the public authorities.

The singers declared a better perception of quality of life in the Psychological domain of the WHOQOL-Bref. The best scores in this domain are noteworthy and should be explored in future studies. As this study did not include a control group, it is not possible to state that a better perception of self-reported quality of life by popular singers is related to the benefits provided by the singing activity. However, research has shown the positive effects of music and singing on people's well-being⁽¹⁹⁻²¹⁾.

Our data revealed that singers over 40 years old had a better perception of quality of life and less vocal handicap. Findings from another study found better quality of life for people over 45 years old⁽¹³⁾. Another study in which the MSHI was used related more time in activity and experience of the popular singer to less vocal handicap⁽⁸⁾.

Popular singers with a better income had better averages in the scores of the WHOQOL-Bref. As in other studies^(13,22-24), there is a need for public health professionals and managers to focus on actions aimed at people with lower income to improve their quality of life.

The scores obtained at the MSHI show that the Defect subscale was the one with the worst scores in the mean of the scores and that the Handicap subscale had the best scores. Other surveys with singers have had similar results^(7,8,11,25-27). These results indicate that singers, even if they have vocal changes, may not perceive vocal handicap. As already suggested in a previous study⁽²⁸⁾, popular singers may have little sensitivity to perceive vocal changes early or underestimate their complaints until the moment when they limit or prevent their professional activities. This fact is worrying, considering the importance of a healthy voice for these professionals, who, possibly, delay in seeking medical and speech-language therapy help.

Singers without vocal complaints in this study had very low scores on the MSHI, suggesting little vocal handicap.

The absence of vocal complaints was also related to less handicap in other studies^(7,8,11,12,25-27). On the other hand, singers with vocal complaints had higher mean scores on the MSHI than in other studies that used the same instrument^(7,8,11,25-27), except in a survey conducted with singers with vocal complaints referred for rehabilitation⁽¹²⁾. These data alert, again, to the fact that the singers in this sample may be at vocal risk.

For the total sample of singers in this research, the mean MSHI was 25.88 (considering scores ranging from zero to 120), indicating little vocal handicap. However, another study that used the same instrument and evaluated choral singers found an average score of 20.97 on the MSHI, and this population was considered at vocal risk⁽²⁹⁾. The absence of a cut-off point for the MSHI makes it difficult to interpret the results. MSHI may have the sensitivity to detect singers at vocal risk, while they have relatively low averages if we consider the total score of the instrument. The need for further studies with the MSHI is emphasized, seeking to standardize values that may suggest a cut-off point for the detection of vocal risk in popular singers, so that this instrument can be widely used by speech-language therapists, singing teachers, and otorhinolaryngologists.

This study is probably the first that seeks to correlate the self-perception of quality of life by a generic instrument and the presence of vocal handicap in popular singers. Better quality of life had a weak correlation with a vocal handicap. Longitudinal studies may clarify the repercussions of complaints and vocal handicaps on the overall quality of life of singers over time since they need a healthy voice to exercise their profession⁽³⁰⁾. Another issue to be highlighted is that, although singers with vocal complaints had self-perceived greater vocal handicap and worse quality of life than those without complaints. The weak correlation between vocal handicap and quality of life can demonstrate the importance of the multidimensionality of human beings in the construction of their quality of life. Other aspects of the singer's life can have a beneficial influence, reducing the negative contribution of vocal handicap in his self-perception of quality of life.

The data in this study suggest that socioeconomic and personal aspects need to be better investigated in this professional category and reveal the importance of studies that investigate people's quality of life since they are population health indicators. The results can identify health needs and actions to promote quality of life and well-being for people.

The construction of a specific instrument of self-perception of quality of life and directed to the population of popular singers, which addresses issues related to it can be useful in health care programs, given that an instrument of self-perception of vocal handicap does not cover all the aspects of life, health and dimensions of this population, which has specific characteristics.

Studies with other samples of popular singers should be done to confirm the data obtained in this research. This study has limitations: absence of a control group; it was carried out in a specific region of Brazil, with different sociodemographic characteristics from large urban centers; no studies were found that applied the WHOQOL-Bref or any other instrument that assessed the global quality of life of popular singers, which limited the discussion of the results.

CONCLUSION

Better quality of life had a predominantly weak correlation with a less vocal handicap in the sample of popular singers in this study. However, those who presented vocal complaints had self-perceived worse quality of life and greater vocal handicap, with statistical significance for all domains of the WHOQOL-Bref and subscales of the MSHI. Singers with better income and aged over 40 years old presented self-perception of a better quality of life and less vocal handicap.

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Author contributions

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