Diagnosis of Dysphonia Among Municipal Employees: Individual and Work Factors

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Summary: Objective. To investigate the association between occupational status and the distribution of dysphonia.
Methods. In 2009, a sample of 5646 (14%) of the population of 38 304 municipal employees of Belo Horizonte was obtained. A questionnaire was made available on an Internet Web site that could be entered only after the respondent had given consent. The response variable was drawn up with reference to the question: "Has a doctor ever told you that you have dysphonia?," for which the possible responses were yes or no. The following variables were included in the logistic regression model: sociodemographic data, work characteristics, and lifestyle habits.
Results. The associations relating to dysphonia were found to be different between men and women. Differing from men, occupational factors influenced the outcome among women. Among men, there were significant associations between dysphonia and sociodemographic characteristics, health-related factors, and lifestyle factors.
Conclusion. Gender differentials should be taken into consideration in health promotion actions among this group of municipal employees.
Key Words: Dysphonia–Working conditions–Teachers–Occupational health.

INTRODUCTION

Dysphonia is an alteration in the speaking or singing voice that may cause discomfort and body pain, thereby resulting in limitations of day-to-day life and work activities.[1] Both acute and chronic factors may precipitate dysphonia. The main cited causes include vocal overload because of work demands, physical trauma, lifestyle, environmental characteristics, medications, and health problems.[2,3]

According to conservative estimates, the incidence is 7% in the general population, and this rises to 29% when lifetime prevalence is taken into consideration.[4] These estimates are doubled when groups at risk are studied. According to the records of specialized clinics, laryngopathy with or without nodules is more common among teachers, singers, nurses, radio presenters, and gym monitors. The diagnostic conditions are manifested with symptoms of vocal fatigue and hoarseness, and these are intensified in situations of intensive voice use.[5]

Findings relating to cofactors have been inconclusive.[6] Nonetheless, it is known that stress and sound intensity are potent risks for vocal overload, especially among women.[5] Psychological pressure may have an important role. Teachers who report voice problems are thought to be more vulnerable to psychiatric diseases, such as anxiety or depression.[6]

The differences in the distribution of voice morbidities according to profession have led to implementation of health and safety at work measures in many countries, and these are based on evidence relating to the weight of environmental and contextual factors in triggering or worsening vocal symptoms.[7] In summary, dysphonia is a health problem affecting women more severely,[8] that is of multifactorial origin, with clear predominance among individuals exposed to demands on their voices.

The weight of socioeconomic position is recognized when differentials in the distribution of health events are studied. The term "socioeconomic position" is used to refer to the socially derived economic factors that influence what positions individuals or groups hold within the multiple-stratified structure of a society.[9] Occupational status measures particular aspects of socioeconomic position. Occupational status also reflects social standing and may be related to health outcomes because of certain privileges, such as easier access to and better quality of health care, access to education, and more salubrious residential facilities, that are more easily achieved for those of higher standing.[10] However, it is also likely that the distribution of morbidities is related to the type of exposure to working conditions in specific occupational categories. Thus, working conditions are believed to modify the effects of socioeconomic position, which in turn are intrinsically related to the schooling and income levels of the subjects studied.[11]

The present study had the aim of ascertaining associations between occupational status and dysphonia in a sample of municipal employees.

METHODOLOGY

The question posed in this study was addressed in a sample that took into account different occupations encompassed by a single stable employment linkage. An epidemiological survey was conducted from September to December 2009, in which the target population was formed by 38 304 municipal employees of Belo Horizonte.

The questionnaire was made available after a pilot study had been concluded. The questionnaire used was organized into eight groups of responses, with approximately 120 questions: (1) demographic and functional, (2) domestic activities and living habits, (3) state of health, (4) vaccines, (5) working environment, (6) acts of violence: becoming a victim, (7) work demands, and (8) quality of life. It was a self-administered questionnaire on the Internet that was freely answered at the individual's workplace. It could only be accessed after the

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individual had read and agreed to the consent statement that had been approved by the Research Ethics Committee of the City Authority of Belo Horizonte (report: 0054.0.410.000.09[a]).

The survey was widely publicized through meetings with the administrative body of all entities of the City Authority of Belo Horizonte, notices on the Internet and intranet, and messages on payslips, among other means, with the aim of clarifying the objectives and the importance of participation. This publicity sought to achieve adherence of as many as eligible subjects as possible. The trade unions representing the municipal employees also notified and made aware of the objectives of the survey and its importance.

With the aim of obtaining representation from all bodies within the administration, the number of questionnaires filled out was monitored every week, through a systematized process devised by a computer technology company in the municipality. In this manner, it was possible for the investigative team to reinforce the publicity measures among managers and workers at localities with lower adherence.

The questionnaire was accessed by 6490 workers (16.9%). In the end, a sample of 5646 employees (14.7%) was obtained, that is, the number of employees who effectively answered the questionnaire. However, the quantity of data lost varied according to the variable because of fluctuations in the number of responses provided by the participants (a single respondent might fail to give responses for some of the questions in the questionnaire). We considered that such occurrences would not compromise the analysis, given that average percentage of lost data was 5%. The group was not randomized, but there was no difference between the respondents and nonrespondents in relation to sex and age group, which suggests that homogeneity was achieved between the groups. However, contrasting with the overall population, individuals with bachelor's or postgraduate degrees predominated among the respondents.[12]

The response variable was drawn up with reference to the question: "*Has a physician ever told you that you have dysphonia?*," for which the possible responses were yes or no.

Given the multidimensional nature of dysphonia (individual, environmental, and behavioral), the Phoniatry Committee of the European Laryngological Society has suggested that broad protocols should be used in studies on voice alterations.[13] Their recommendation was accepted for the present study, and the dimensions implied in specific domains were incorporated, including the following: (1) individual and demographic characteristics, (2) work characteristics, and (3) health and living habits. A review of the literature made it possible to construct a theoretical model (Figure 1) that guided the selection of independent variables, which were classified in groups to draw up a hierarchical model for structuring the analysis.

For the present study, event determination groups were structured (Figure 1). The first group included *age group* in complete years (up to 29, 30–39, 40–49, and 50 or older), *conjugal situation* (with partner or without partner), and *children* (no or yes). The variable of conjugal situation was originally obtained in terms of the following responses: single, married, together, stable union, widowed, separated, legally separated or divorced; and these were subsequently dichotomized.

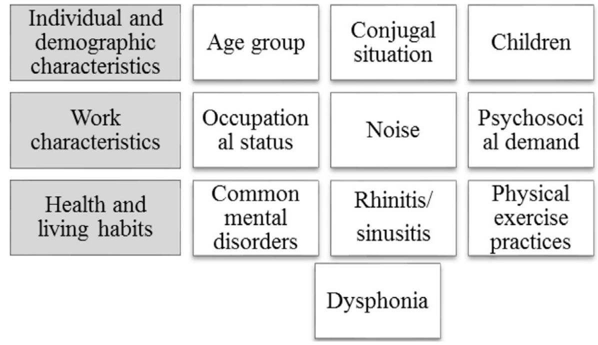

FIGURE 1. Model structured in groups for analyzing the diagnosis of dysphonia among municipal employees in Belo Horizonte.

The second group included occupational status, noise, and psychosocial demand. In 2009, the City Authority of Belo Horizonte had employees in 384 functions according to the municipal plan of positions and careers. The respondents were distributed into 255 functions, and these were incorporated into the analyses (Table 1).

It was decided to use the occupational category as a measurement referring to social class, given that occupation influences subjects' positioning in the social structure. Social class links individuals to the distribution of economic and social resources, which affects health care opportunities.[14,15] The occupational classification makes it possible to examine particular aspects and also more generic mechanisms of socioeconomic position, which may explain the association between occupational status and becoming ill.[16–18]

To define occupational status, the International Socioeconomic Index (ISEI) was used. This was constructed taking into consideration information on individuals' education, occupation, and income.[19] The ISEI scale has been validated with regard to its applicability in different contexts, and it has strong correlations with other scales. The resulting set of scores range of 16–90, with Judges gaining the highest score. The lowest score is jointly held by two unit groups: (1) farmhands and laborers and (2) helpers and cleaners in offices, hotels, and other establishments.[20] To obtain the ISEI, the codes in the Brazilian Occupational Classification corresponding to the job position plan of the City Authority of Belo Horizonte had to be obtained. The Brazilian Occupational Classification was instituted through ministerial ordinance no. 397, of October 9, 2002, with the aim of identifying occupations in the labor market. In cases in which no direct correspondence was found between

TABLE 1.
Total Number of Functions According to the Classifications Used

Classification	Total
City Authority of Belo Horizonte	255
Brazilian Occupational Classification	108
Clasificación Internacional Uniforme de Ocupaciones 88	68
International Socio-Economic Index	32

the city's job position and the Brazilian classification, strategies were used to find the code that best resembled the function, based on the following factors: (1) attributions and competencies of the function, (2) minimum schooling level required for exercising the function, (3) basic salary for the function, and (4) workplace.

After obtaining the correspondence between the city's job position and the Brazilian classification, the codes were converted to the *Clasificación Internacional Uniforme de Ocupaciones 88* (CIUO88) system using the conversion table available on the Web site of the Ministry of Work and Employment (http://www.mtecbo.gov.br/). This conversion was necessary because the syntax available on the International Stratification and Mobility File Web site for obtaining the ISEI is based on the CIUO88 codes.

The decisions regarding the coding were reached as a consensus between three health sector researchers, and careful analysis was conducted at each stage to ensure similarity of definitions attributed to the codes according to the different classifications used.

The following values were found for the ISEI: minimum of 23 and maximum of 88, with a mean of 49.05 (standard deviation, 20.59). The variable was categorized as high, medium high, medium low, and low occupational statuses, using the respective quartiles ($\geq$29, 30–38, 39–69, and $\leq$70). Last, the positioning of certain functions that took into account basic income and the minimum schooling level required for the function was adjusted.

After creating the occupational status variable, the representativeness of the functions that made up each category was observed. Among the functions with high status, physicians made up the largest proportion; with medium high status, teachers; with medium low status, administrative assistants; and last, with low status, health agents and auxiliaries.

In parallel with defining occupational status, noise at the workplace was taken into consideration and was assessed as low, conversation level, or loud. The psychosocial demand of the work (active work, low wear, high wear, or passive work) and social support at work (high or low) were obtained through the reduced version of the questionnaire originally formulated by Karazek, with adaptation for Portuguese.[21] Social support dimension is concerned with the level of social interaction between worker and colleagues/superiors. Lack of support may also generate negative consequences to health.[21]

In the third group, common mental disorders (CMDs), rhinitis/sinusitis, and physical exercise practices were the axes, along which the responses relating to health and living habits were grouped. The presence or absence of CMDs was measured by means of the responses to the 20 questions that make up the Self-Reporting Questionnaire 20.[22] The presence of rhinitis or sinusitis was determined by means of self-reporting of the medical diagnosis (yes or no). The level of physical activity practices was found in terms of three possible responses, namely, more than three times a week, less than three times a week, or no physical activity practiced.

Descriptive analysis was performed on the data using absolute and percentage measurements of the explanatory variables in relation to the response variable. Multivariable analysis was performed by stratifying the sample according to gender, given that in cases of dysphonia, this factor has some relevance in explaining the outcome.

A logistic regression model was estimated based on the theoretical model (Figure 1). The variables that presented significance at P values less than 0.20 in the univariable analysis were selected for the multivariable analysis. Variables with a significance level of <0.05 were kept in the final model.

The analysis on factors associated with dysphonia that was diagnosed by a physician was done using binary-response logistic regression. This strategy made it possible to determine the magnitude of each association by means of the odds ratio (OR). The statistical significance was taken to be within the 95% confidence interval. The analysis was done using the STATA software, version 10.0 (Stata Corp., College Station, TX).

RESULTS

The proportion of self-reported dysphonia diagnosed in the study population was 10.9% overall (n = 585) and 4.6% (n = 76) for males and 14.2% (n = 489) for females. Dysphonia was diagnosed more frequently among male workers older than 50 years (7.71%) and among those who had children (5.13%). There was no difference regarding marital status: 4.58% among individuals with a partner and 4.59% without a partner.

In the female group, the employees who reported having dysphonia were concentrated in the age group from 40 to 49 years (19.24%); in the marital status group, without a partner (14.36%) and among those with children (15.67%). In the univariable analysis, associated with dysphonia were the age group and children variables for males and females (Table 2).

Regarding the characteristics of the work, the greatest proportion of the men who reported having dysphonia belonged to the high occupational status group (6.11%), among those who classified the noise as loud (8.09%). They also reported experiencing high wear at work (6.94%) and low social support (5.09%) (Table 3).

The greatest proportion of the women who reported having dysphonia belonged to the medium high occupational status group (19.29%) and classified the noise level at the workplace as loud (19.16%). Regarding psychosocial factors, the women were concentrated in the group that reported experiencing active work (17.92%) with low social support (15.47%). In the univariable analysis, only social support was not associated with dysphonia for males (Table 3).

In relation to health and living habits, there were no differences between the men and women. The greatest proportions were concentrated in the groups whose reports were compatible with CMDs (10.04% for men and 20.02% for women), diagnoses of rhinitis or sinusitis (7.23% and 19.19%, respectively), and physical inactivity (6.65% and 15.37%, respectively). In the univariable analysis, all variables were associated with dysphonia for males and females (Table 4).

In the final model, the chances of reporting dysphonia were 4.6 and 4.4 greater in the groups of men aged 40–49 years and 50 years or older, respectively, when these two groups were compared with the age group up to 29 years.

TABLE 2.
Frequency of dysphonia and univariable analysis according to sociodemographic characteristics by sex, Belo Horizonte 2009

Variables	Male, n (%)	OR (CI)	Female, n (%)	OR (CI)
Age group				
Up to 29	7 (2.18)	1	31 (6.15)	1
30–39	13 (2.80)	1.29 (0.51–3.28)	88 (10.35)	1.76 (1.15–2.70)**
40–49	26 (5.32)	2.52 (1.08–5.87)**	242 (19.24)	3.63 (2.46–5.37)***
50 or more	30 (7.71)	3.75 (1.62–8.65)**	128 (15.29)	2.75 (1.83–4.15)***
Conjugal situation				
With partner	46 (4.58)	1	257 (13.97)	1
Without partner	30 (4.59)	1.00 (0.62–1.60)	230 (14.36)	1.03 (0.85–1.25)
Children				
No	25 (3.77)	1	144 (11.58)	1
Yes	51 (5.13)	1.38 (0.85–2.25)*	345 (15.67)	1.42 (1.15–1.74)***

Notes: Each variable analyzed had missing data; totals differ with respect to the final population.
Abbreviations: OR, odds ratio; CI, confidence interval.
*$P < 0.20$, **$P < 0.05$, and ***$P < 0.001$.

Workers with reports compatible with CMDs presented chances of reporting dysphonia 2.98 times greater than the chances among those without this condition. Having a diagnosis of rhinitis or sinusitis doubled the chance of having a diagnosis of dysphonia, in comparison with the group who did not have rhinitis or sinusitis (OR = 2.45). The individuals who reported that they were physically inactive presented a 2.17 times greater chance of reporting dysphonia, in comparison with those who practiced physical activity three or more times per week (Table 5).

The final model was different between the sexes. Differing from men, the characteristics of the work influenced the outcome in the group of women. In the age group of 30 years or older, women presented a greater chance of reporting dysphonia, with OR ranging from 1.67 to 4.00 (OR = 1.67 between 30 and 39 years; OR = 4.00 between 40 and 49 years; and OR = 3.60 for 50 years or older), comparing these groups with the women aged up to 29 years. The women classified as having medium high and low occupational status presented, respectively, 3.36 and 2.18 times greater chance of dysphonia, in comparison with those of high occupational status. Regarding noise at the workplace, a positive dose-response gradient was observed for women who considered that the noise was

TABLE 3.
Frequency of dysphonia and univariable analysis according to work characteristics by sex, Belo Horizonte 2009

Variables	Male, n (%)	OR (CI)	Female, n (%)	OR (CI)
Occupational status				
High	8 (6.11)	1	10 (6.37)	1
Medium high	23 (4.96)	0.81 (0.35–1.84)	258 (19.29)	3.51 (1.83–6.77)***
Medium low	10 (2.17)	0.34 (0.13–0.88)**	55 (8.46)	1.36 (0.68–2.73)
Low	29 (5.49)	0.89 (0.40–2.00)	141 (12.52)	2.10 (1.08–4.09)**
Noise at the workplace				
Low	17 (3.92)	1	45 (8.09)	1
Conversational level	24 (3.05)	0.77 (0.41–1.45)	201 (12.65)	1.64 (1.17–2.31)**
Loud	30 (8.09)	2.16 (1.17–3.98)**	224 (19.16)	2.69 (1.92–3.77)***
Psychosocial demand				
Low wear	16 (3.60)	1	79 (10.60)	1
Active work	14 (5.74)	1.63 (0.78–3.96)*	143 (17.92)	1.84 (1.37–2.47)***
Passive work	19 (3.30)	0.91 (0.46–1.80)	113 (11.81)	1.13 (0.83–1.53)
High wear	20 (6.94)	1.99 (1.02–3.92)**	122 (17.38)	1.77 (1.31–2.40)***
Social support				
High	29 (3.89)	1	141 (11.93)	1
Low	41 (5.09)	1.33 (0.82–2.15)	306 (15.47)	1.35 (1.09–1.67)**

Notes: Each variable analyzed had missing data; totals differ with respect to the final population.
Abbreviations: OR, odds ratio; CI, confidence interval.
*$P < 0.20$, **$P < 0.05$, and ***$P < 0.001$.

TABLE 4.
Frequency of dysphonia and univariable analysis according to health and living habits by sex, Belo Horizonte 2009

Variables	Male, n (%)	OR (CI)	Female, n (%)	OR (CI)
CMDs				
No	41 (3.22)	1	225 (10.84)	1
Yes	26 (10.04)	3.56 (2.01–5.59)***	201 (20.02)	2.06 (1.67–2.53)***
Rhinitis/sinusitis				
No	33 (3.05)	1	150 (8.92)	1
Yes	42 (7.23)	2.47 (1.55–3.95)***	339 (19.19)	2.43 (1.98–2.98)***
Physical exercise practices				
More than three times a week	14 (2.84)	1	81 (11.11)	1
Less than three times a week	19 (3.61)	1.28 (0.64–2.59)	117 (14.08)	1.31 (0.97–1.77)*
No physical activity practiced	42 (6.65)	2.43 (1.31–4.51)**	288 (15.37)	1.45 (1.11–1.89)**

Notes: Each variable analyzed had missing data; totals differ with respect to the final population.
Abbreviations: OR, odds ratio; CI, confidence interval; CMDs, common mental disorders.
*$P < 0.20$, **$P < 0.05$, and ***$P < 0.001$.

conversational level and loud (OR = 1.55 and 2.31, respectively). Female workers with reports compatible with CMDs had an 88% greater chance of having dysphonia in comparison with those without CMDs (OR = 1.88). Having a diagnosis of rhinitis or sinusitis increased the chance of reporting a diagnosis of dysphonia around twofold, in comparison with the group that did not have rhinitis or sinusitis (OR = 2.24). The female workers who reported that they were physically inactive had a 41% greater chance (OR = 1.41) of reporting dysphonia, in comparison with those who were active three or more times a week (Table 5).

DISCUSSION

The analysis made it possible to identify the characteristics associated with dysphonia among municipal employees in Belo Horizonte and showed that the effect differed between men and women. For males, age group, CMDs, rhinitis/sinusitis, and physical exercise practices were associated with dysphonia in the final model. For females, age group, occupational status, noise at the workplace, CMDs, rhinitis/sinusitis, and physical exercise practices were associated with dysphonia in the final model.

It was noteworthy that there were reports of diagnoses of dysphonia among younger age groups (younger than 60 years). Voice quality deficits are less common among younger individuals, given that degenerations in the structures of the phonation system are expected at more advanced ages.[23,24]

This analysis on 5646 municipal employees in Belo Horizonte who were exposed to different levels of demands on their voices revealed distinct associations when the results were separated according to gender. In the modeling, the characteristics of the work did not maintain a relationship with the diagnosis of dysphonia in the male group, unlike the evidence among the female group, which indicated that the characteristics of the work were strongly expressed.

Several reports at international level have drawn attention to the different risks to which male and female workers are subjected, because of either segregation of functions, or working conditions, or biological differences. Sex and gender issues are interrelated both within and outside the workplace and have a direct effect on differentials of exposure to risks and development of health complaints.[25]

With regard to dysphonia, the difference attributed to sex relates to the particular physiological and anatomical features of the female larynx.[26] These features are associated with difficulties that exposed that individuals have regarding demands for vocal power to speak.[27]

In addition to biological factors, gender differences determine placement within the labor market. Nowadays, women's participation in both formal and informal areas is increasing, like in the service sector, particularly in education and health care establishments. It needs to be noted that these sectors are marked by lower remuneration, precariousness of the working environment, lack of autonomy and control over the work, and higher demands on the voice.[25]

Inequalities of salaries, working conditions, and health have not diminished. In addition, domestic tasks have continued to be under women's responsibility, despite the increase in the proportion of women in the labor market.[28]

Medium high and low occupational statuses were associated with reports of dysphonia in the group of women. In comparison with the group with high occupational status, belonging to the medium high occupational status category indicated a 3.36 times greater chance ($P = 0.001$) of reporting a diagnosis of dysphonia. This association can be explained by the massive presence of teachers in the medium high category. It can be asked whether, in this case, their activity and resultant exposure to voice demands might have more force in expressing the symptoms than would the predictive effects of medium high occupational status. It should be emphasized that, in carrying out teaching activities, the combination of prolonged use of the voice and environmental factors increases the intensity of the phonation demanded, with known effects on voice health.[29,30]

For the women with low occupational status (health agents and auxiliaries), there was a 2.18 times greater chance of reporting a diagnosis of dysphonia than in the group of high occupational

TABLE 5.
Final model of variables associated with dysphonia by sex, Belo Horizonte 2009

Variables	Male	Female
	OR (CI)	
Sociodemographic		
Age group		
Up to 29	1	1
30–39	2.21 (0.70–6.99)	1.67 (1.03–2.72)*
40–49	4.60 (1.55–13.58)*	4.00 (2.56–6.27)**
50 or more	7.80 (2.63–23.10)**	3.60 (2.24–5.78)**
Work		
Occupational status		
High		1
Medium high		3.36 (1.66–6.80)*
Medium low		1.49 (0.70–3.20)
Low		2.18 (1.06–4.47)*
Noise at the workplace		
Low		1
Conversational level		1.55 (1.06–2.26)*
Loud		2.31 (1.58–3.38)**
Health and living habits		
CMDs		
No	1	1
Yes	2.98 (1.72–5.14)**	1.88 (1.49–2.37)**
Rhinitis/sinusitis		
No	1	1
Yes	2.45 (1.45–4.14)*	2.24 (1.77–2.85)**
Physical exercise practices		
More than three times a week	1	1
Less than three times a week	1.59 (0.73–3.45)	1.28 (0.90–1.81)
No physical activity practiced	2.17 (1.08–4.39)*	1.41 (1.03–1.93)*

Notes: Each variable analyzed had missing data; totals differ with respect to the final population.
Abbreviations: OR, odds ratio; CI, confidence interval; CMDs, common mental disorders.
*$P < 0.05$, and **$P < 0.001$.

status. Worse occupational status relates to disadvantages that have a negative effect on health because the occupation models the physical and psychosocial working conditions, which directly affect health and modify the potential for work.[31]

Lower occupational status indicates exposure to worse working conditions and worse state of health for the workers.[32] In the present study, it was seen that occupational status was a significant predictor for dysphonia, even after controlling for other risk factors. This result corroborates evidence regarding the vulnerability of individuals exposed to precarious working conditions.[33]

When the level of environmental noise is loud, communication is impaired, and this constitutes a situation with the risk of developing dysphonia.[34] In the present study, the self-assessment of noise in the workplace was significantly associated with the event, with a dose-response gradient: women who reported experiencing loud noise levels had a 2.31 times greater chance of reporting a diagnosis of dysphonia, in comparison with the group that reported that there was low noise.

The variables of the health and living habits group (CMDs, rhinitis/sinusitis, and physical activity) remained associated with dysphonia, with similar gradients independent of sex. According to the literature, stress and anxiety may be the origin of voice problems, or they may be caused by voice problems, thus creating a vicious circle between the emotional and voice symptoms.[35,36]

Exposure of the larynx to irritants of the mucosa alters the delicate mechanism of the voice. Individuals with greater exposure to allergens are more likely to have voice symptoms than are those with lower exposure. From this, the importance of evaluating working environments to avoid worsening the condition can be seen.[37]

Among workers who did not practice physical activity, the chance of presenting dysphonia was greater, which strengthens the debate regarding the harm to the phonation system caused by sedentary lifestyles.[38] It should be emphasized that the benefits of physical activity for individuals' general well-being have a positive repercussion on the voice.[39]

Some limitations of the present study need to be mentioned. The results may have been influenced by the low response rate, lost values, and healthy worker bias, given that retired workers and those on sick leave were excluded from the analyses. In this light, these results cannot be generalized to the entire workforce of municipal workers in Belo Horizonte. It should be noted that the observed homogenous nature of these workers' stable employment patterns made it possible to reject hypotheses providing explanations regarding the effects of precarious living conditions that unstable employment or unemployment tend to determine.[40]

The results obtained revealed that significant numbers of workers reported diagnoses of dysphonia. These results strengthened the knowledge about relationships with age group, work characteristics (for women), health, and living habits. They indicated that there is a need for policies aimed toward preventing major risk factors for not only teachers but also all professionals who use their voice as a resource for their work. In modern societies, around one-third of the workforce is in professions in which the activities depend on using the voice. In a general manner, voice problems are very common, but they occur more frequently in specific occupational groups.[41] Most people who complain of voice problems say that these have a negative impact on their work and quality of life. The Brazilian Academy of Laryngology and Voice has estimated that 20–30% of Brazilians are affected by some type of lesion in the vocal folds.[42] The literature is very clear in this regard, but until the present study, there had not been any studies on dysphonia among municipal public employees.

Approaches centered on individuals to the detriment of deeper reflection on the context of becoming ill have been questioned.[43] Prevention of dysphonia based on the principles of health promotion, focusing on improvement of working conditions, would be a powerful means for avoiding unfavorable evolution of voice symptoms. Debating and consequently elucidating these issues may contribute toward the basis for measures that can transform such situations, given that, on the one hand, individuals' characteristics may not be susceptible to external actions, but on the other hand, public policies could modify the factors that surround these individuals.[44]

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