

# Voice Disorder and Burnout Syndrome in Teachers

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**Summary: Objective:** The objective of this study was to assess the association between burnout syndrome and the likely presence of voice disorders among teachers from a public elementary school in the country town of Sergipe.

**Methods:** This is a cross-sectional study in which 208 teachers completed the following questionnaires: the Condition of Vocal Production-Teacher (CPV-P), the Screening Index for Voice Disorder (SIVD), and the Burnout Syndrome Evaluation Questionnaire (CESQT).

**Results:** Of the 208 teachers, 76.9% were women, 77.9% came from rural areas, and 64.4% were likely to have a voice disorder. Teachers with a career length of over 15 years were almost twice as likely to have a voice disorder. Of the symptoms listed in the SIVD, the following were most prevalent: dry throat (88.1%), hoarseness (84.4%), and fatigue when speaking (82.1%). Among the burnout subscales, psychic exhaustion was the most common (30.3%). Analyses revealed that probable voice disorder was associated with psychic exhaustion with an odds ratio of 1.78 ( $P < 0.001$ ,  $\chi^2 = 84.1\%$ ). Teachers with positive scores on two to four burnout subscales had an odds ratio of 4.01 ( $P = 0.013$ ,  $\chi^2 = 86.2\%$ ) for a probable voice disorder compared with those with positive scores on zero to one subscale.

**Conclusions:** The present results confirmed that burnout syndrome was associated with the presence of a probable voice disorder.

**Key Words:** Teachers—Voice disorders—Professional exhaustion—Voice—Occupational health.

## INTRODUCTION

Voice disorders are a major cause of illness among teachers, often causing discomfort and making it difficult to carry out day-to-day and work-related activities.<sup>1</sup> Health issues among teachers, including voice-related problems, are associated with the physical teaching environment and with school management characteristics.<sup>2,3</sup>

Many speech-language pathology studies have focused on the teaching profession at different educational levels,<sup>4</sup> particularly regarding teachers' vocal profiles. The available data indicate frequent vocal symptoms that are often related to inadequate work environment conditions, for example, background noise necessitating speaking at a higher tone; the presence of dust, which triggers allergic reactions<sup>5-7</sup>; and inappropriate work organization. In the literature, the following factors are commonly associated with voice disorders: prolonged work days, stressful pace, lack of autonomy, frequent threatening situations to the teacher, assaults, insults, and violence at the school entry.<sup>4,8-10</sup> Notably, most studies have analyzed the conditions of teachers working in urban areas.

A variety of mental disorders, including burnout syndrome (also termed professional exhaustion syndrome), can cause physical and psychological damages that affect workers' health.<sup>11,12</sup> The Brazilian Ministry of Health defines professional exhaustion syndrome as a prolonged response to emotional and chronic interpersonal stressors at work, which predominantly affects service or health-care providers who are in direct contact with users, including education professionals.<sup>13</sup>

Burnout among teachers can affect teaching goals and the educational environment to the extent that these professionals experience a process of dehumanization and apathy, which can contribute to health problems, absenteeism, and intent to leave the profession.<sup>14</sup> Numerous studies demonstrate increasing rates of staff turnover, absenteeism, and sick leave among teachers at various educational levels over recent decades, in association with an increasing incidence of mental health problems affecting teachers.<sup>15,16</sup> Researchers have attempted to identify factors that may be associated with burnout syndrome.<sup>14,17</sup> In relation to the nature of a teacher's job and to the context in which these professionals work, there are several stressors that, if persistent, can lead to burnout syndrome, compromising the teacher's working, social, and emotional life.

Building on the available data, we performed the present study with the aim of improving our understanding of the association between voice disorders and burnout syndrome among public school teachers from elementary schools in largely rural areas of the country town of Sergipe.

## METHODS

This cross-sectional study was approved by the Ethics Committee of the Pontifical Catholic University of São Paulo

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(statement number 746.681, CAEE: 26991314.3.0000.5482). Our study sample included 208 teachers and was randomly defined and stratified by zone and total number of teachers. To recruit the study sample, we randomly selected 34 schools, maintaining a proportion of approximately 20% urban areas and 80% rural areas. We then randomly selected 50% of the teachers from each school. Thus, we were able to ensure the representativeness of the schools, even though some had only one teacher.

All participating teachers signed the Free and Informed Consent Term and were present at the time of the visit to the school. These visits were held on all working days, during morning and afternoon shifts, between August and November of 2014. All participants completed three instruments: the Condition of Vocal Production-Teacher (CPV-P), the Screening Index for Voice Disorder (SIVD), and the Burnout Syndrome Evaluation Questionnaire (CESQT).

The CPV-P comprises 62 questions referring to sociodemographic data, functional situations, general health aspects, life habits, and vocal aspects.<sup>18</sup> In the present study, subjects were characterized according to sociodemographic data (date of birth, marital status, and education; questions 1–5), functional situations (time spent on professional activities, workload, school relationships, and activities performed; questions 6–12), and work organization and environment (relationships at work, type of work, physical effort, presence of violence; questions 29–50).

The SIVD is an instrument for epidemiologic surveillance that is designed to identify voice disorders according to self-reported vocal symptoms and validated by Ghirardi et al.<sup>19</sup> The SIVD addresses 12 symptoms—hoarseness, loss of voice, failing voice, rough voice, hawking, dry cough, cough with secretion, pain when speaking, pain when swallowing, secretions in the throat, dry throat, and fatigue when speaking—rated on a four-point Likert scale with possible responses of never, rarely, sometimes, and always. Each symptom reported as occurring sometimes or always counts as one point toward the total score. The final score is a sum that can vary from 0 to 12, and a score of  $\geq 5$  points is considered to indicate that the teacher likely has a voice disorder.

The Portuguese version of the CESQT (the *Cuestionario para la Evaluación del Síndrome de Quemarse por el Trabajo*) was validated for use in evaluating burnout syndrome among Brazilian populations by Gil-Monte et al.<sup>20</sup> This questionnaire features 20 items divided into four subscales. The first subscale, illusion at work, is defined as an individual's expectation of achieving certain work targets, as this implies a source of personal and professional achievements (five items). The second subscale is psychic exhaustion, defined as the presence of emotional and physical exhaustion due to work activity, related to having to connect daily with people who have or generate problems (four items). The third subscale is indolence or depersonalization, defined as the presence of negative attitudes, such as indifference and cynicism, toward the organization's customers (six items). The fourth subscale is guilt, defined as behavior and negative attitudes developed at work, mainly regarding the

people with whom the worker must professionally interact with (five items). These items are evaluated using a five-point Likert scale with possible responses of never, rarely (a few times a year), sometimes (a few times a month), often (a few times a week) and very often (every day). The intermediate answer (sometimes) counts as two points. Each subscale score is calculated as the average score of the items comprising it. High levels of burnout syndrome are implied by low scores for illusion at work ( $< 2$ ) or high scores in psychic exhaustion and indolence or depersonalization, and guilt ( $\geq 2$ ) implies high levels of the burnout syndrome.<sup>20,21</sup>

In addition to the analysis proposed by the questionnaire, a grouping of the subscales of burnout was conducted, which featured two groups: one that considered when the subject had no positive subscale or had only one of the positive subscales, and the other, when two to four scales were positive. It should be remembered that there was no hierarchy among the scales, just a cumulative sum.

Descriptive analysis of data through absolute and relative frequencies, central tendency (mean and median), and dispersion measures (standard, minimum and maximum deviation) was performed.

To verify the association between the dependent variable (probable voice disorder) and independent variables (burnout and grouping of burnout scales, sociodemographic and functional aspects, and organization of work), we used the chi-square test, and when a quad presented expected values equal to or less than 5, the Fisher exact test was applied. Univariate and multiple logistic regression models were also applied. The variables that presented a  $P$  value of  $< 20\%$  in the univariate analysis were tested in the multiple model using the Stepward technique. For statistical significance, a descriptive level of 5% was assumed. Data were typed in *Excel* and analyzed using the *SPSS version 17.0 for Windows* (SPSS Inc., Chicago, IL).

## RESULTS

Our analysis included a total of 208 teachers, of whom 76.9% were women and 77.9% were from rural areas (Table 1). The mean age was 41 years (standard deviation [SD], 8.8; median age, 40 years; range, 22.9–66.3 years), and 61.5% were married or were in a stable union. The average career length was 16.1 years (SD, 9.3; median, 15.1 years), with a minimum career length of less than a year (0.33 years) and a maximum career length of 36.2 years. The frequency of a probable voice disorder ( $\geq 5$  points on the SIVD) was 64.4%.

Table 2 presents the distribution of the symptoms reported on the SIVD. Teachers with probable voice disorders reported greater occurrence of dry throat (88.1%), hoarseness (84.4%), and fatigue when speaking (82.1%). Even among teachers without probable voice disorders, 33.8% reported experiencing hoarseness sometimes or always.

Table 3 shows the distributions of high and low scores on the burnout subscales in the CESQT-PE. Teachers showed

**TABLE 1.**  
Teachers' Demographic and Professional Characteristics and Probable Presence of Voice Disorder as Determined by the SIVD

Variable	Category	n	(%)
Gender	Female	160	76.9
	Male	48	23.1
Marital status	Single	58	27.9
	Married or stable union	128	61.5
	Separated or divorced	17	8.2
	Widow or widower	5	2.4
Zone	Rural	162	77.9
	Urban	46	22.1
Number of schools that you work at	One	125	60.1
	Two	69	33.2
	Three	9	4.3
	Four	5	2.4
Hours per week with students	≤10	8	3.8
	11–20	73	35.1
	21–30	42	20.2
	31–40	60	28.8
	>40	25	12.0
SIVD	No VD	74	35.6
	With VD	134	64.4
Total		208	100.0

Abbreviation: VD, voice disorder.

the highest percentage of high scores on the exhaustion subscale (30.3%), with an average score of 1.46 points (SD, 0.86; median, 1.25; range, 0–4 points). The average score on the illusion subscale was 3.07 points (SD, 0.83; median, 3.20; range, 0–4 points). For the indolence or depersonalization subscale, the average score was 0.73 point (SD, 0.52; median, 0.67; range, 0–2.50 points). The average score on the guilt subscale was 0.98 point (SD, 0.76; median, 0.90;

**TABLE 3.**  
Distributions of Teachers With High Versus Low Scores on Subscales of the Burnout Syndrome Evaluation Questionnaire (CESQT-PE)

Variable	Category	n	(%)
Illusion	High ( $\geq 2$ )	183	88.0
	Low ( $< 2$ )	25	12.0
Exhaustion	Low ( $< 2$ )	145	69.7
	High ( $\geq 2$ )	63	30.3
Indolence or depersonalization	Low ( $< 2$ )	202	97.1
	High ( $\geq 2$ )	6	2.9
Guilt	Low ( $< 2$ )	178	85.6
	High ( $\geq 2$ )	30	14.4
Grouping	0–1 subscale scores indicating burnout	179	86.1
	2–4 subscale scales indicating burnout	29	13.9
Total		208	100.0

range, 0–3.80 points). In the grouping analysis, 13.9% of the teachers had a positive score (indicating burnout) on two to four of these subscales.

Among the tested sociodemographic variables and aspects of functional status, career length showed a statistically significant association with the probable presence of voice disorder (Table 4). Compared with teachers with a career length of less than 15 years, those with a career length of over 15 years had a higher likelihood of presenting a probable voice disorder (72.1% vs. 56.7%,  $P=0.020$ ). The odds ratio (OR) was 1.97 for teachers with a career length of over 15 years to have a probable presence of voice disorder ( $P=0.021$ ). We found no statistically significant associations between work organization characteristics as independent variables and the probable presence of voice disorder (Table 5)

**TABLE 2.**  
Number and Percentage of Teachers, According to Symptoms Present in the SIVD, Stratified by Probable VD

SIVD Symptoms	No VD				With VD			
	Never	Rarely	Sometimes	Always	Never	Rarely	Sometimes	Always
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Hoarseness	8 (10.8)	41 (55.4)	23 (31.1)	2 (2.7)	2 (1.5)	19 (14.2)	79 (59.0)	34 (25.4)
Loss of voice	48 (64.9)	24 (32.4)	2 (2.7)	0 (0.0)	41 (30.6)	45 (33.6)	43 (32.1)	5 (3.7)
Failing voice	28 (37.8)	40 (54.1)	6 (8.1)	0 (0.0)	20 (14.9)	28 (20.9)	73 (54.5)	13 (9.7)
Rough voice	37 (50.0)	23 (31.1)	13 (17.6)	1 (1.4)	21 (15.7)	28 (20.9)	66 (49.3)	19 (14.2)
Hawking	22 (29.7)	34 (45.9)	16 (21.6)	2 (2.7)	10 (7.5)	15 (11.2)	74 (55.2)	35 (26.1)
Dry cough	15 (20.3)	39 (52.7)	20 (27.0)	0 (0.0)	8 (6.0)	26 (19.4)	83 (61.9)	17 (12.7)
Cough with secretion	26 (35.1)	34 (45.9)	14 (18.9)	0 (0.0)	15 (11.2)	31 (23.1)	82 (61.2)	6 (4.5)
Pain when speaking	49 (66.2)	23 (31.1)	2 (2.7)	0 (0.0)	38 (28.4)	40 (29.9)	50 (37.3)	6 (4.5)
Pain when swallowing	41 (55.4)	30 (40.5)	3 (4.1)	0 (0.0)	32 (23.9)	45 (33.6)	54 (40.3)	3 (2.2)
Secretions in the throat	33 (44.6)	32 (43.2)	8 (10.8)	1 (1.4)	19 (14.2)	35 (26.1)	65 (48.5)	15 (11.2)
Dry throat	9 (12.2)	42 (56.8)	21 (28.4)	2 (2.7)	4 (3.0)	12 (9.0)	92 (68.7)	26 (19.4)
Fatigue when speaking	31 (41.9)	29 (39.2)	14 (18.9)	0 (0.0)	8 (6.0)	16 (11.9)	87 (64.9)	23 (17.2)

Abbreviation: VD, voice disorder.

**TABLE 4.**  
**Associations of Probable VD With Sociodemographic Characteristics and Functional Aspects Based on Chi-square Tests and Univariate Binary Logistic Regression**

Variables	Group		$P(\chi^2)$	OR*	95% CI	$P$
	No VD n (%)	With VD n (%)				
Gender						
Female	53 (33.1)	107 (66.9)	0.177	1.0		
Male	21 (43.9)	27 (56.3)		0.64	0.33–1.23	0.179
Age (y)						
<40	42 (40.4)	62 (59.6)	0.148	1.0		
≥40	32 (30.8)	72 (69.2)		1.52	0.86–2.70	0.148
Marital status						
Married or stable union	46 (35.9)	82 (64.1)	0.891	1.0		
Single, divorced, or widowed	28 (35.0)	52 (65.0)		1.04	0.58–1.87	0.891
Zone						
Rural	53 (32.7)	109 (67.3)	0.106	1.0		
Urban	21 (45.7)	25 (54.3)		0.58	0.30–1.13	0.108
Career length (y)						
≤15	45 (43.3)	59 (56.7)	<i>0.020</i>	1.0		
>15	29 (27.9)	75 (72.1)		1.97	1.11–3.52	<i>0.021</i>
In how many schools do you work at?						
1	44 (35.2)	81 (64.8)	0.889	1.0		
2–4	30 (36.1)	53 (63.9)		9.96	0.54–1.71	0.988
Another activity using the voice						
No	34 (37.0)	58 (63.0)	0.711	1.0		
Yes	40 (34.5)	76 (65.5)		1.11	0.63–1.97	0.711
Hours per week with students						
≤30	45 (36.6)	78 (63.4)	0.715	1.0		
>30	29 (34.1)	56 (65.9)		1.11	0.62–1.99	0.715
Total	74 (35.6)	134 (64.4)				

\* The group without probable presence of voice disorder was used as the reference category. “No VD” indicates no probable voice disorder, and “with VD” indicates probable voice disorder.

The numbers are italicized to show the statistical result.

Abbreviations: CI, confidence interval; VD, voice disorder.

The presence of a probable voice disorder was statistically significantly associated with considering the work repetitive and with performing intense physical activities (Table 6). There was also a greater probability of voice disorders among teachers who believed that their work is repetitive compared with others (70.5% vs. 57.3%;  $P=0.047$ ; OR, 1.78) and among teachers who performed activities requiring intense physical activities compared with teachers who did not report this (78.0% vs. 49.5%;  $P<0.001$ ; OR, 3.61). Teachers who stated that work factors impacted their health had a greater probability (69.6%) of presenting probable voice disorders compared with teachers who did not report this (69.6% vs. 46.8%;  $P=0.005$ ; OR, 2.60).

Table 7 presents the associations of probable voice disorder with the burnout subscales and the grouping of burnout subscales. Compared with others, those teachers with positive scores for exhaustion had a higher likelihood of probable voice disorder (84.1% vs. 55.9%; OR, 1.78;  $P<0.001$ ). Teachers with positive scores on two to four burnout subscales had an OR of 4.01 ( $P=0.013$ ) for probable voice

disorder compared with teachers with positive scores on zero to one burnout subscale ( $\chi^2=86.2\%$  vs. 60.9%,  $P=0.008$ ).

The multiple binary logistic regression analysis took into consideration the variables that presented  $P$  values of  $<0.20$ . Two final models were constructed. Model A included exhaustion caused by burnout syndrome as the main independent variable, and model B included the grouping of burnout subscores as the main independent variable (Table 8). The variables shown to be independent factors related to the probable presence of voice disorder included exhaustion, performing intense physical activities, and having constant supervision. Teachers with psychic exhaustion had an OR of 3.07 ( $P=0.007$ ) for presenting with a probable voice disorder compared with teachers not positive for this component of burnout syndrome. Similarly, model A revealed that probable voice disorder was more likely in teachers who performed intense physical activities ( $P=0.015$ ; OR, 2.43) and had constant supervision ( $P=0.033$ ; OR, 2.94). In model B, teachers with positive

**TABLE 5.**  
**Associations of Probable VD with Work Organization Characteristics According to Chi-square Tests and Univariate Binary Logistic Regression**

Variables	Group		$P(\chi^2)$	OR*	95% CI	$P$
	No VD n (%)	With VD n (%)				
You have a good relationship with your colleagues.†						
No	0 (0.0)	2 (100.0)	0.539	1.0		
Yes	74 (35.9)	132 (64.1)		–	–	–
You have a good relationship with the school board.						
No	0 (0.0)	0 (0.0)	–	1.0		
Yes	74 (35.6)	134 (64.4)		–	–	–
You have a good relationship with students.†						
No	1 (100.0)	0 (0.0)	0.356	1.0		
Yes	73 (35.3)	134 (64.4)		–	–	–
You have a good relationship with students' parents.†						
No	1 (20.0)	4 (80.0)	0.657	1.0		
Yes	73 (36.0)	130 (64.0)		0.44	0.05–4.06	0.473
You are allowed to plan and carry out activities.†						
No	3 (33.3)	6 (66.7)	1.000	1.0		
Yes	71 (35.7)	128 (64.3)		0.90	0.22–3.71	0.886
There is constant supervision.						
No	13 (52.0)	12 (48.0)	0.067	1.0		
Yes	61 (33.3)	122 (66.7)		2.17	0.93–5.03	0.072
The pace of work is stressful.						
No	8 (42.1)	11 (57.9)	0.533	1.0		
Yes	66 (34.9)	123 (65.1)		1.35	0.52–3.53	0.534
There is appropriate material.						
No	14 (29.8)	33 (70.2)	0.346	1.0		
Yes	60 (37.3)	101 (62.7)		0.71	0.35–2.53	0.347
Total	74 (35.6)	134 (64.4)				

Notes: “–” indicates values not calculated because of cells with zero values, “no VD” indicates no probable voice disorder, and “with VD” indicates probable voice disorder.

\* The group without probable presence of voice disorders was used as the reference category.

† Fisher exact test.

Abbreviations: CI, confidence interval; VD, voice disorder.

scores for two to four subscales for burnout syndrome were more likely to present with a probable voice disorder ( $P=0.047$ ; OR, 3.30) compared with teachers with zero to one positive burnout subscale scores. Probable voice disorder was also associated with performing physical effort (OR = 2.65,  $P=0.007$ ) and having constant supervision (OR = 3.03,  $P=0.027$ ) in model B.

## DISCUSSION

The present study was conducted among teachers of public elementary schools in the country town of Sergipe. We found that the majority of teachers worked in schools in rural areas (77.9%). In contrast, a prior study among teachers in the country town of Bahia (average Municipal Human Development Index Education of 0.678) reported that only 43.4% of teachers worked at schools in rural areas.<sup>22</sup> Notably, it is important to conduct research at educational establishments in rural areas because the majority of research investigates schools in urban areas.

Our study population was predominantly women (76.9%), similar to data reported in several previous studies.<sup>4,5,9</sup> However, a greater male population was reported in a study conducted in São Paulo and Florianópolis. Accordingly, data from the census conducted by the National Institute of Educational Study and Research Anísio Teixeira (INEP) indicate that the Northeast region has proportionately more men working as teachers in elementary education than other regions of the country.<sup>23</sup> The high number of male teachers can be further explained by the provenance of teachers from the countryside. It is possible that the difficult access to the countryside discourages female teachers, thereby attracting the male population to teach in this region. Notably, many teachers who participated in the study lived in a city or a region close to their work, and only limited work opportunities are available in these places, potentially encouraging more men to enter the teaching field.

The profile of our study population with regard to age and years of teaching experience was similar to the findings

**TABLE 6.**  
**Associations of Probable VD With Work Characteristics According to Chi-square Tests and Univariate Binary Logistic Regression**

Variables	Group		<i>P</i> ( $\chi^2$ )	OR*	95% CI	<i>P</i>
	No VD	With VD				
	n (%)	n (%)				
There is enough work material.						
No	15 (29.4)	36 (70.6)	0.290	1.0		
Yes	59 (37.6)	98 (62.4)		0.69	0.35–1.37	0.291
You consider your work monotonous.						
No	43 (39.4)	66 (60.6)	0.221	1.0		
Yes	31 (31.3)	68 (68.7)		1.43	0.81–2.53	0.222
You consider your work repetitive.						
No	41 (42.7)	55 (57.3)	<i>0.047</i>	1.0		
Yes	33 (29.5)	79 (70.5)		1.78	1.01–3.17	<i>0.048</i>
You have enough time to conduct activities at school.						
No	12 (27.9)	31 (72.1)	0.238	1.0		
Yes	62 (37.6)	103 (62.4)		0.64	0.31–1.34	0.240
You take work home.						
No	3 (25.0)	9 (75.0)	0.545	1.0		
Yes	71 (36.2)	125 (63.8)		0.59	0.15–2.24	0.435
You are allowed to leave the room as needed.						
No	18 (36.7)	31 (63.3)	0.846	1.0		
Yes	56 (35.2)	103 (64.8)		1.07	0.55–2.08	0.846
You exert intense physical effort.						
No	50 (50.5)	49 (49.5)	<i>&lt;0.001</i>	1.0		
Yes	24 (22.0)	85 (78.0)		3.61	1.98–6.59	<i>&lt;0.001</i>
Frequent weight-carrying activities.						
No	44 (41.1)	63 (58.9)	0.086	1.0		
Yes	30 (29.7)	71 (70.3)		1.65	0.93–2.94	0.087
Employees are committed to maintenance and organization.						
No	7 (36.8)	12 (63.2)	0.904	1.0		
Yes	67 (35.4)	122 (64.6)		1.06	0.40–2.83	0.904
You are satisfied with your function.						
No	1 (14.3)	6 (85.7)	0.425	1.0		
Yes	73 (36.3)	128 (63.7)		0.29	0.03–2.47	0.259
There is stress in your work.						
No	7 (41.2)	10 (58.8)	0.615	1.0		
Yes	67 (35.1)	124 (64.9)		1.30	0.47–3.56	0.616
Work factors impact your health.						
No	25 (53.2)	22 (46.8)	<i>0.004</i>	1.0		
Yes	49 (30.4)	112 (69.6)		2.60	1.34–5.05	<i>0.005</i>
Do situations of violence occur (theft of personal belongings)?						
No	55 (36.9)	94 (63.1)	0.522	1.0		
Yes	19 (32.2)	40 (67.8)		1.23	0.65–2.33	0.523
Theft of school supplies						
No	52 (38.5)	83 (61.5)	0.228	1.0		
Yes	22 (30.1)	51 (69.9)		1.45	0.79–2.67	0.229
Bullying incidents						
No	31 (40.3)	46 (59.7)	0.279	1.0		
Yes	43 (32.8)	88 (67.2)		1.38	0.77–2.47	0.280
Fights between students						
No	16 (47.1)	18 (52.9)	0.126	1.0		
Yes	58 (33.3)	116 (66.7)		1.79	0.84–3.74	0.129
Violence against teachers and staff						
No	49 (40.2)	73 (59.8)	0.100	1.0		
Yes	25 (29.1)	61 (70.9)		1.64	0.91–2.95	0.101
Acts of vandalism						
No	27 (36.0)	48 (64.0)	0.924	1.0		
Yes	47 (35.3)	86 (64.7)		1.03	0.57–1.86	0.924
Violence at the school entry						
No	41 (36.9)	70 (63.1)	0.661	1.0		
Yes	33 (34.0)	64 (66.0)		1.14	0.64–2.01	0.661
Total	74 (35.6)	134 (64.4)				

\* The group without probable presence of voice disorders was used as the reference category.

The numbers are italicized to show the statistical result.

Abbreviations: CI, confidence interval; VD, voice disorder.

**TABLE 7.**  
**Associations or Probable VD With Burnout Characteristics According to Chi-square Tests and Univariate Binary Logistic Regression**

Variables	Group		<i>P</i> ( $\chi^2$ )	OR*	95% CI	<i>P</i>
	No VD n (%)	With VD n (%)				
<b>Burnout subscales</b>						
<b>Illusion</b>						
No	65 (35.5)	118 (64.5)	0.962	1.0		
Yes	9 (36.0)	16 (64.0)		0.98	0.41–2.34	0.962
<b>Exhaustion</b>						
No	64 (44.1)	81 (55.9)	<i>&lt;0.001</i>	1.0		
Yes	10 (15.9)	53 (84.1)		4.19	1.98–8.87	<i>&lt;0.001</i>
<b>Indolence or depersonalization†</b>						
No	74 (36.6)	128 (63.4)	0.091	1.0		
Yes	0 (0.0)	6 (100.0)		–	–	–
<b>Guilt</b>						
No	68 (38.2)	110 (61.8)	0.054	1.0		
Yes	6 (20.0)	24 (80.0)		2.47	0.96–6.36	0.060
<b>Grouping</b>						
0–1 positive subscales	70 (39.1)	109 (60.9)	<i>0.008</i>	1.0		
2– positive subscales	4 (13.8)	25 (86.2)		4.01	1.34–12.03	<i>0.013</i>
<b>Total</b>	<b>74 (35.6)</b>	<b>134 (64.4)</b>				

Notes: “–” indicates values not calculated because of cells with zero values, “no VD” indicates no probable voice disorder, and “with VD” indicates probable voice disorder.

\* The group without a probable presence of a VD was used as the reference category.

† Fisher exact test.

The numbers are italicized to show the statistical result.

Abbreviations: CI, confidence interval; VD, voice disorder.

**TABLE 8.**  
**Multiple Binary Logistic Regression Analysis**

Variable	Category	OR <sub>adjusted</sub> *	95% CI	<i>P</i>
<b>Burnout exhaustion (model A)</b>				
	No	1.0		
	Yes	3.07	1.35–6.94	0.007
<b>You perform with intense physical effort.</b>				
	No	1.0		
	Yes	2.43	1.19–5.00	0.015
<b>There is constant supervision.</b>				
	No	1.0		
	Yes	2.94	1.10–7.92	0.033
<b>Burnout grouping (model B)</b>				
	0–1 positive subscales	1.0		
	2–4 positive subscales	3.30	1.01–10.72	0.047
<b>You perform with intense physical effort.</b>				
	No	1.0		
	Yes	2.65	1.30–5.41	0.007
<b>There is constant supervision.</b>				
	No	1.0		
	Yes	3.03	1.34–8.11	0.027

\* OR<sub>adjusted</sub> includes adjustment for the following variables: gender, zone, repetitive work, career length, work factors impacting health, fights between students, and frequent weight-carrying activities.

Abbreviation: CI, confidence interval.

of an exploratory study of Brazilian teachers conducted by the INEP.<sup>23</sup> The average age of the sample was 41 years (SD, 8.8), similar to the previously reported average age of 38 years among Brazilian teachers.<sup>23</sup> Similar findings were reported in the studies by Ferreira et al<sup>9</sup> and Marçal and Peres.<sup>5</sup> The teachers in our study had an average of 16.1 years of teaching experience, which was also similar to the averages reported by Ferreira et al<sup>9</sup> and Giannini et al.<sup>10</sup>

The teachers in the present study predominantly worked in only one school, similar to the data reported by Ferreira et al<sup>24</sup> and to the finding of the INEP that 80.9% of teachers in Brazil work in only one school.<sup>23</sup> Our data also indicated that the largest proportion of teachers spent 11–20 h/wk with their students. This finding is characteristic of the type of employment among teachers in the studied city. It is also similar to the findings of the INEP,<sup>23</sup> which reported a prevalence of teachers working for just one shift in elementary schools in Brazil (63.8%). However, this time spent with students was lower compared with reports from studies of teachers in Florianópolis<sup>5</sup> and in São Paulo.<sup>10</sup>

The SIVD scores revealed that 64.4% of teachers in the present study had a probable voice disorder. This finding is similar to the findings reported by Ferreira et al<sup>24</sup> and Lima-Silva et al,<sup>25</sup> which were obtained using the CPV-P (ie, the matrix of the SIVD used in our present study). Ferreira et al<sup>24</sup> assessed teachers from elementary and middle schools in São Paulo and found that 60.0% reported that they had a current or a previous experience of some type of vocal change. Lima-Silva et al<sup>25</sup> assessed teachers from the municipal network of Sorocaba and reported that 63.3% had a current or a previous voice disorder. Other studies have revealed probable voice disorders in about 50% of teachers based on a self-reported questionnaire similar to the CPV-P, with Marçal and Peres<sup>5</sup> reporting a 47.6% rate of voice disorders among elementary school teachers in Florianópolis (47.6%) and Medeiros et al<sup>26</sup> reporting a rate of 52% among teachers of Belo Horizonte.

Research on voice issues among teachers shows variable types and frequencies of self-reported vocal symptoms, in accordance with the studied population and other variables. Here, we found that dry throat, hoarseness, and fatigue when speaking were the most common vocal symptoms, which were also common symptoms in the studies of Ferreira et al,<sup>9</sup> Giannini et al,<sup>27</sup> and Andrade.<sup>28</sup> Teachers are required to speak under inadequate environmental and organizational conditions, leading to overloading of the phonation system. Multiple factors favor the presence of vocal discomfort, including low hydration, lack of rest, and inadequate nutrition.

Of the four subscales on the CEQUEST-PE questionnaire, teachers most commonly had scores indicating burnout on the psychic exhaustion subscale (30.3%), followed by the guilt (12.2%), illusion (12%), and indolence or depersonalization (6%) subscales. Similar findings were reported among teachers of special education at all schools in the central region of Rio Grande do Sul, with 25.4% showing psychic exhaustion, 14.3% showing guilt, and 6.3% showing

illusion at work.<sup>29</sup> Another study was also conducted in Rio Grande do Sul, but exclusively among teachers from Porto Alegre, and the authors also reported that psychic exhaustion was most prevalent (36.7%).<sup>30</sup> A study of teachers from schools in Portugal found that 45.5% had high levels of psychic exhaustion, 12.8% had high levels of indolence or depersonalization, 9% had low illusion at work, and 7.1% had a sense of guilt.<sup>31</sup> The results of all of these studies support the finding that the psychic exhaustion subscale is the most appropriate for identifying burnout syndrome among teachers, regardless of their place of work.

We also analyzed the association between probable vocal disorder and groupings of positive subscales of the burnout questionnaire (CEQUEST-PE), which was the methodological procedure used by Simões.<sup>32</sup> We found that 13.9% of teachers had scores indicating burnout on two to four subscales, which was a slightly lower percentage than previously reported (27.6%). Notably, positive scores on a greater number of subscales correspond to a more intense burnout syndrome.

The presence of a probable voice disorder was also significantly associated with the length of the teacher's career in our present study. Previous reports in the literature show conflicting results regarding this association. In studies that identify a significant association between vocal changes and career length, the authors explain this relationship in terms of the amount of time that the voice is required over many years and the teachers' greater age.<sup>22,25</sup> Behlau<sup>33</sup> suggests that voice changes may occur in people of advanced age, beyond the period of maximum vocal efficiency (25–45 years of age). This suggestion would explain the increased vocal exhaustion over time. On the other hand, some studies do not find a significant association between career length and voice disorders. These authors propose that teachers find ways to adapt their vocal use to their daily work over many years, and thus present fewer symptoms.<sup>34–36</sup> Another possible explanation involves the teaching career development plan, which generally allows a teacher with more experience to choose their schools and classrooms and to thus have greater control over their working conditions.<sup>37</sup> Overall, the relationship between vocal changes and career length likely varies among studies because of differences in the study characteristics, such as the teachers' level of performance, subject selection, and sample size. This subject should be further explored in future studies.

With regard to work organization, teachers reported having good relationships with work colleagues, students, parents of students, and the school management. This finding is similar to the data reported by Jardim et al.<sup>37</sup> However, other studies demonstrate that these relationships constitute an intense source of mental exhaustion.<sup>41</sup> It is possible that the present results are related to the fact that the included schools were set in the countryside and thus had lower turnover and higher possibility of work team formation. It was expected that probable voice disorders would be significantly associated with a stressful pace of work; however, this result was not obtained. In contrast, a study of teachers in São Paulo (from schools in a large urban

metropolis) reported that voice disorders were associated with stress at work under highly demanding situations.<sup>38</sup>

We identified a positive association between probable voice disorders and finding the work to be repetitive. This relationship was also reported by Giannini *et al*<sup>38</sup> in a study of teachers in São Paulo. Giannini *et al* found that among the teachers who exhibited vocal changes in the vocal and otorhinolaryngological evaluation, 80% regarded their work as repetitive. Our present results also indicated that probable voice disorders were associated with exerting intense physical effort. Such physical exertion was certainly related to the performance of activities beyond those assigned to the role of a teacher. The high proportion of teachers who reported intense physical exertion at work can likely be explained by the fact that most were from rural areas. Schools in these regions lack structure and skilled labor, and thus the teachers are required to perform tasks beyond teaching, including weight-carrying activities and contributing to school environment organization. Moreover, we found that probable voice disorders were associated with health issues. Similarly, Marçal and Peres<sup>5</sup> reported a relationship between vocal changes and self-reported health issues, such as allergic rhinitis, sinusitis, pharyngitis, depression, and lack of regular physical exercise.

Because the objective of the present study was to investigate the association between a probable voice disorder and burnout syndrome among teachers, we utilized a questionnaire validated exclusively for use with teachers (CEQUEST-PE). Among the subscales that comprise this questionnaire, the psychic exhaustion subscale showed a significant association with probable voice disorder ( $\chi^2$  of 84.1%), as did the grouping of positive scores on two to four subscales ( $\chi^2$  of 86.2%).

Some studies have evaluated associations between other factors and burnout syndrome measured using another questionnaire (MBI). Batista *et al*<sup>39</sup> conducted a study among teachers from the school network of João Pessoa and found that 33.6% of the assessed teachers reported high levels of emotional exhaustion, 43.4% reported low professional achievement, and 8.3% reported high levels of depersonalization. Moreover, the teachers tended to associate these feelings with work overload in the teaching profession, exclusive dedication to teaching, and the feeling that the profession was stressful. Santana *et al*<sup>40</sup> identified a correlation between burnout syndrome among teachers and working conditions that interfered with health, with teachers reporting that they experienced hoarseness and pain in their upper limbs at the end of the day. Zhang *et al*<sup>41</sup> conducted research among Chinese teachers and verified that emotional exhaustion and depersonalization were associated with the presence of anxiety in the studied population.

While other studies have not specifically identified an association between burnout syndrome and voice disorders, there are previous reports of teaching leading to exhaustion and disease under certain conditions.<sup>17</sup> Situations experienced in a teacher's daily work seem to favor illness, which can emerge as discomfort, distress, grief, despair, fatigue, discouragement, and sorrow.<sup>42</sup> The findings of psychic

exhaustion among teachers in the present study should be understood as a consequence of the emotional and physical exhaustion caused by teaching activities, which include several psychosocial stressors, some related to the nature of teaching duties and others related to the institutional and social contexts.<sup>43</sup> Teachers who work under pressure must develop self-care behaviors, such as practicing better body posture or vocal projection, and may end up inadvertently adopting strategies that cause physical and mental fatigue.<sup>8</sup>

Work performance under highly demanding circumstances can have negative repercussions on mental health and is associated with stress, dissatisfaction at work, and burnout syndrome. Our present results indicated that burnout syndrome was highly associated with the performance of intense physical activities and with constant supervision. Teachers commonly perform other tasks while they are teaching, such as helping students individually, managing the classroom, and completing assessment forms and tools.<sup>8</sup> In a previous study, Assunção *et al*<sup>44</sup> reported that the presence of dysphonia was associated with poor working conditions and high physical demand tasks. This report corroborates the present findings, indicating that situations involving overlapping tasks contribute to teachers' physical, vocal, and mental exhaustion.

Teachers work every day under poor working conditions, subject to a hierarchy, and with the pressure of constant supervision, while still seeking to foster a creative and stimulating teaching environment.<sup>45</sup> This set of factors creates a counterpoint between conformism and resistance, which can lead to mental and physical symptoms. The high occurrence of voice disorders in this population reinforces the hypothesis that teachers suffer from work-related exhaustion and indisposition.<sup>46</sup>

The present results indicate a need for preventive protocols that should not be restricted to vocal care. Rather, such protocols should provide a broader view of health and should be enacted through a team of health-care professionals, including speech-language therapists, physiotherapists, and psychologists. To this end, it is necessary to review and improve the training of these professionals so that they can more effectively work with teachers. For nearly two decades, speech-language pathologists have encouraged the recognition of the work-related voice disorder. Although their efforts have drawn attention to the issue, they have not achieved official recognition, which partly explains the lack of governmental initiatives.

## CONCLUSIONS

Our present data confirmed that teachers with the probable presence of voice disorders are more likely to exhibit burnout syndrome. Voice disorders were also associated with certain work-related factors, including finding the work to be repetitive, working under constant supervision, and having to perform tasks requiring intense physical exertion. These factors associated with vocal changes should be considered in the formulation and implementation of preventive measures for voice-related illnesses among teachers.

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