



Original Article

Relationship between functional vocal disability and professional quality of life in teaching staff: a cross-sectional study

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ABSTRACT

Introduction. Teachers are exposed to occupational risk factors that may compromise vocal health, potentially affecting professional quality of life (PQL). Prolonged voice use, environmental noise, and inadequate ergonomics contribute to physical, emotional, and psychosocial strain.

Objective. To examine the relationship between vocal disability and PQL among early childhood, primary, secondary and high school teachers.

Methods. A descriptive cross-sectional study was conducted. This study included 250 teachers in public, subsidized and private educational centers from the Community of Madrid and the city of Valladolid during the 2024–2025 academic year. Participants completed the Professional Quality of Life-35 (PQL-35) and Voice Handicap Index-30 (VHI-30) questionnaires.

Results. Most teachers reported mild vocal disability, with higher prevalence in women and older age groups. Early childhood and primary teachers exhibited more moderate cases. No significant correlation was found between vocal disability and PQL ($p=0.008$, $p=0.90$). Regression analysis identified multiple factors influencing PQL, including motivation, managerial support, work disconnection, salary satisfaction, and worsening of voice in the afternoon.

Discussion. Isolated vocal disorders does not have a linear relationship with PQL, highlighting the multifactorial nature of teacher well-being. Psychosocial and organizational factors play a pivotal role, emphasizing the need for preventive interventions, ergonomic improvements, and vocal health programs.

Conclusions. Voice disorders are prevalent among teachers but have limited isolated effect on PQL. A holistic approach adopting controls in the educational field and preventive measures, both organizational and technical, could reduce the incidence of voice disorders and their possible impact on professional well-being in educational settings.

Keywords: Occupational Health; Occupational Health Nursing; Quality of Life; School Teachers; Voice Disorders.

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Introduction

Given the influence of work on various aspects of life and the considerable time it occupies (1,2), the concept of Professional Quality of Life (PQL) has emerged (3). PQL is closely related to job satisfaction and is influenced by factors such as a favourable work environment, safe working conditions, adequate remuneration, and opportunities for professional development, all of which contribute to a subjective sense of well-being (4,5). A validated and widely used instrument for measuring PQL is the Professional Quality of Life-35 (PQL-35) questionnaire, which evaluates this construct multidimensionally (3,6–8).

Within the educational sector, teachers face a range of occupational demands, including excessive workload, psychosocial stress, and ergonomically inadequate working environments (9), which may increase the risk of both physical and mental health problems (10). Among the most prevalent health problems are respiratory tract infections, musculoskeletal disorders, voice disorders and psychosocial conditions (11,12).

Teachers use their voice as their main working tool, which plays an essential role in their daily work. El uso prolongado, sostenido y de alta intensidad de la voz es el principal factor de riesgo en el desarrollo de problemas relacionados con la voz. The symptoms may include vocal strain, musculoskeletal discomfort, and psycho-emotional disturbances, all of which are exacerbated by insufficient rest periods (13, 14). Acute cases typically have a sudden onset following intense vocal effort, whereas chronic conditions develop after prolonged exposure (15,16).

According to Royal Decree 1299/2006 and the Guide for the Evaluation of Occupational Diseases, the only pathology officially recognised as an occupational disease among teachers are vocal cord nodules (15,16). Therefore, establishing the occupational origin of voice disorders requires sufficient and documented evidence of sustained vocal strain due exclusively to work-related causes, as in the case of teaching staff (15,16).

Several external factors can also contribute to the development of these disorders, including exposure to environmental noise, low temperatures, and poor air quality (15,17–19). Environmental ergonomics is therefore crucial when assessing educational spaces, taking into account parameters such as noise levels, lighting, and indoor environmental quality (20–22). Exposure to noisy environments where multiple voices compete can lead to

the ‘Lombard effect’, an involuntary increase in vocal intensity and fundamental frequency as an adaptive response in speech (23,24).

Other contributing factors include inadequate hygiene while speaking, tight cervical muscles, poor training in vocal projection, excessive coffee intake, and harmful habits such as alcohol consumption and/or smoking (14,15,17,18). Moreover, a significant association has been observed between voice disorders and comorbid conditions such as respiratory infections, asthma, allergies, and gastro-oesophageal reflux (17,25,26).

Individual characteristics such as age, sex, and years of teaching experience may also influence the likelihood of developing vocal disorders. Some studies have found that self-reported voice problems increase with age and professional experience (13,22), and that such disorders are more prevalent among women, possibly due to anatomical and physiological differences in the female larynx, including glottic proportion (22).

Finally, negative psychological factors such as stress, anxiety, and insomnia can contribute to the development of vocal disorders (13,27,28). Inadequate acoustic conditions combined with vocal strain negatively affect emotional well-being, leading to mental fatigue, irritability, and concentration difficulties, which in turn deteriorate perceived PQL. This reduction in PQL adversely impacts job satisfaction and productivity, increasing absenteeism, presenteeism, and lowering the quality of care provided (29–34). Furthermore, these communication difficulties can lead to psychological distress and social withdrawal as individuals attempt to avoid conversations (13,17).

OBJECTIVES

Main objective: To identify whether there is a relationship between vocal disability and the PQL of primary, secondary and early childhood teachers.

Secondary objectives:

- To describe the influence of perceived dysphonia on the perceived PQL of primary, secondary and early childhood teachers.
- To describe the level of vocal incapacity of primary, secondary and early childhood teachers.
- To analyse possible differences in professional quality of life, and vocal disability, between teachers at different levels of education.

Methods

Design. Population. Sample

We conducted a descriptive and analytical cross-sectional study was conducted with a study population of 250 (n=250) active pre-school, primary, secondary and baccalaureate teachers during the 2024-2025 school year, who participated voluntarily after giving informed consent. Professionals without a full-time or internship contract, with temporary or permanent disability, recognised partial or total disability for verbal communication, who carried out extra-occupational activities involving the use of the voice, and those who did not fully complete both questionnaires were excluded.

Subjects were selected by non-probabilistic convenience sampling, choosing participants from schools in the Community of Madrid and the city of Valladolid. The questionnaires were administered after the first term of the academic year, following a break from work, between December 2024 and January 2025.

To estimate the sample size, an alpha error of 0.05 ($Z_{\alpha/2} = 1.96$) and a beta error of 0.20 ($Z_{\beta} = 0.84$) were assumed, with a moderate correlation of $p=0.31$. In the secondary analyses, the correlation was examined in a population stratified into three age groups: 20–35, 36–49, and 50 years or older. A total of 82 participants were required for each of the three age categories, yielding 246 individuals overall. To ensure a balanced distribution across categories and to address potential cases of incomplete data, the sample size was rounded up to 250 participants. This allowed for more flexibility in case the distribution was not exactly 1:1:1 between age categories or in case some data were not usable.

Study variables

Sociodemographic variables

They were collected through a self-administered instrument completed by the participants prior to the questionnaires (Appendix 1).

Main variable: variability of PQL according to vocal disability

The PQL was measured using the PQL-35 questionnaire. This questionnaire provides information on well-being secondary to the perceived balance between work demands and resources (psychological, organisational and relational) available to cope with them (Appendix 2) (6,8,35). The Voice Handicap Index (VHI-30) was used as a measurement

instrument to assess the impact of vocal disorders on voice functioning, voice-related physical abilities and the emotional state of the person (Appendix 3) (13,36–38).

Data collection

The researchers contacted with the centres through institutional channels, inviting participation on a voluntary basis after verifying compliance with the inclusion and exclusion criteria and informing them of the objectives of the study in a single visit to each centre. Subjects who met these criteria were given access to the VHI-30 and PQL-35 questionnaires by means of a QR code that they could scan using an electronic support (Appendix 4), having previously requested informed consent for the full completion of both questionnaires.

Ethical Considerations

This study was conducted in compliance with the legal requirements of Law 14/2007 on Biomedical Research and adhered to the Helsinki Declaration. Data were processed in accordance with EU Regulation 2016/679, Organic Law 03/2018 on the Protection of Personal Data and Guarantee of Digital Rights and Law 41/2002 on patient autonomy. The participants gave their authorisation through the Participant Information Sheet (Appendix 5) and Informed Consent following the approval of the Ethical Committee of Medical Research of the Valladolid Health Areas (report nº 23 of 2024) at the meeting held on 18th December 2024.

Statistical Analysis

A descriptive statistical analysis of the variables studied was carried out. For the description of the ordinal discrete quantitative variables, medians and interquartile ranges were used. For the PQL-35 questionnaire, the results were interpreted using the means and standard deviations of the 35 questions and their three grouped dimensions, applying 95% confidence intervals to ensure precision. For the vocal disability questionnaire, total scores were evaluated by summing the three categories and comparing the results according to gender and age.

To analyse the correlation between vocal disability and PQL, Spearman's test was used, due to the ordinal nature of the data. Additionally, the non-parametric Kruskal-Wallis test

was applied to detect differences in PQL between the different groups according to the severity of vocal disability. Finally, a multiple linear regression analysis was performed to identify the most influential variables in PQL, achieving a fit with an adjusted R^2 of 0.684. The statistical programmes used were Python and GraphPad Prism.

Results

Sociodemographic variables

The sample included 250 teachers, with a predominance of women (75.2%). Most of the teachers were between 36 and 49 years old (42.4%) and worked in the Community of Madrid (52.4%). In terms of educational level, 34.8% taught in primary education and with regard to school management, 67.2% worked in public institutions. The results of these variables are presented in Table 1 to facilitate their detailed analysis.

Relationship between Vocal Disability and PQL

To assess the relationship between vocal disability and PQL, Spearman's test was used, as both variables are ordinal. The correlation coefficient obtained was 0.008 with a $p=0.90$, indicating the absence of a significant linear correlation between these two variables.

When segmenting the sample by age group, the results continued showing a lack of significant correlation:

- 22-35 years: correlation coefficient of -0.06 ($p=0.65$).
- 36-50 years: correlation coefficient of -0,07 ($p=0,49$).
- > 50 years: correlation coefficient of 0,11 ($p=0,31$).

In all cases, the p -values were > 0.05 , which prevents rejection of the null hypothesis and confirms that there is no significant linear relationship between vocal disability and FVC in any of the age ranges. In addition, a Kruskal-Wallis analysis was performed to identify differences in PQL between teachers with different degrees of vocal impairment for each age range. The results showed no significant differences between the groups ($p=0.55$).

Table 1. Qualitative sociodemographic variables

Variables	Qualitative Variables	Frequencies	Percentages
Biological Sex	Woman	188	75,2%
	Man	62	24,8%
Age (years)	Between 22 y 35 years	59	23,6%
	Between 36 y 49 years	106	42,4%
	over 50 years	85	34%
Location	Community of Madrid	131	52,4%
	Valladolid	119	47,6%
Level of teaching provided	Early childhood	27	10,8%
	Early childhood & Primary Education	25	10%
	Primary Education	87	34,8%
	Primary & Secondary Education	2	0,8%
	Secondary Education	37	14,8%
	Secondary Education & High school	40	16%
	High school	32	12,8%
Type of educational institution management	Public	168	67,2%
	Charter	48	19,2%
	Private	34	13,6%

Study of the PQL

To identify the variables that explain the PQL, a multiple linear regression analysis was carried out. All test variables were analysed and those that were significant for the analysis were tested according to their individual p-values. A straight line with an adjusted R² fit of 0.684 was obtained: Quality of life = -0.36 [My voice gets worse in the evening] + 0.25 [Motivation] + 0.18 [Support from my bosses] + 0.17 [I am able to do my current job] + 0.16 [Ability to disconnect from work] + 0.14 [Disconnection at the end of the day] + 0.12 [Satisfaction with salary].

Likewise, the distribution of PQL between the different types of centre management (public, charter and private) was assessed using the Kruskal-Wallis test and no differences

were found by type of centre ($p=0.210$). We also determined whether there were differences between the levels of vocal incapacity using the Chi-square test ($p=0.294$). The p -value was > 0.05 , so it was considered that there was no difference. A significant difference was only found in the question 'My company tries to improve the quality of life at my workplace', which was rated lower in the public centres.

Study of vocal disability by educational level

In the analysis of the distribution of vocal disability by educational level (Figure 1), no statistically significant differences were found, but it did show a tendency for vocal disability to decrease as the level of education increases. As for the results of the relationship between teaching level and vocal disability (Table 2), they show that the majority of teachers had mild levels of vocal disability at all levels of education, so there are no statistically significant differences, but there is a trend. However, a small percentage of severe cases was observed in primary education (3.4%). In secondary and upper secondary education, 87.5% of teachers had mild cases, while in pre-primary and primary education there was a higher proportion of moderate cases compared to upper secondary education. However, no severe cases were found at the latter level.

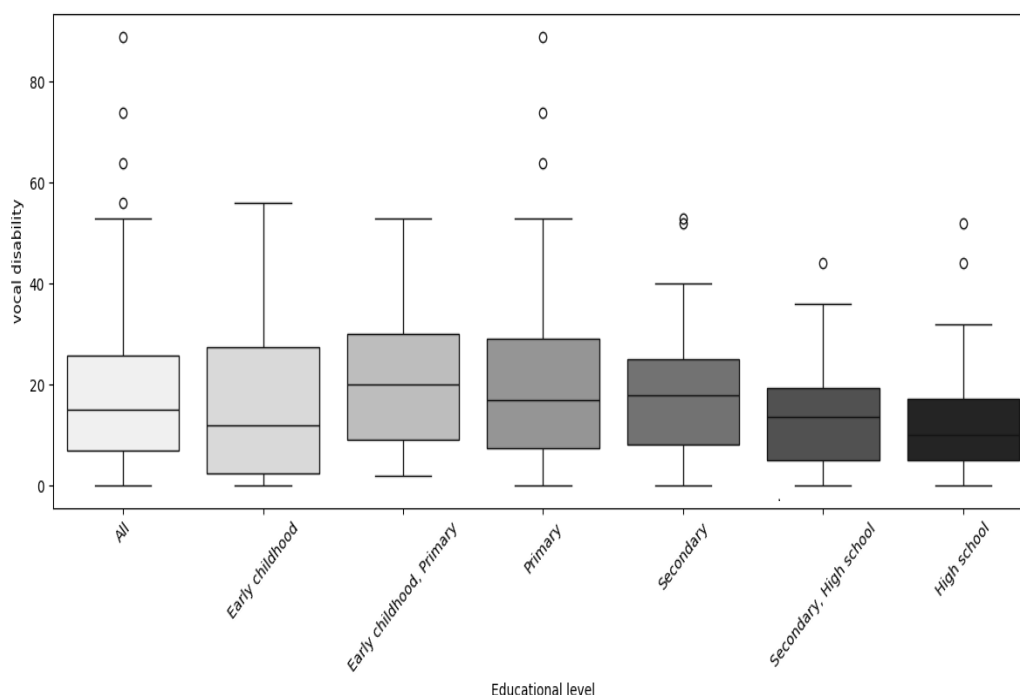


Figure 1. Distribution of Vocal Disability by Educational Level. Box and whisker plot

Table 2. Contingency Table Teaching Level vs. Vocal Handicap Index (VHI-30) score

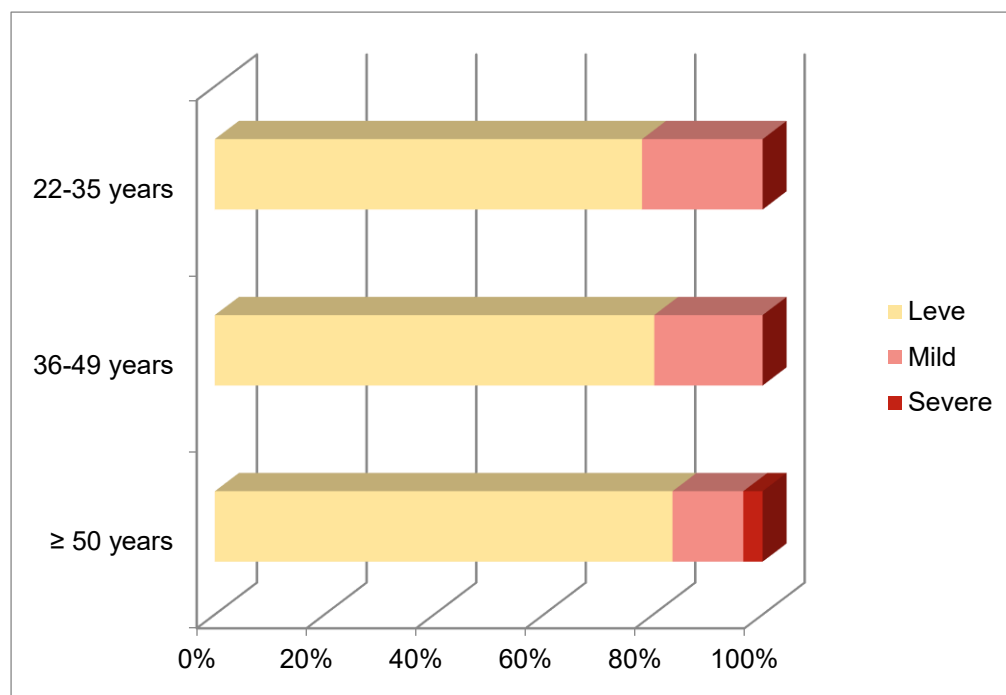
Level of teaching provided	VHI-30 Outcomes	Quantity	Total	Percentages
Early childhood	Mild	22	27	80%
	Moderate	5		20%
Early childhood, Primary Education	Mild	19	25	76%
	Moderate	6		24%
Primary Education	Mild	66	87	75,8%
	Moderate	18		20,6%
	Severe	3		3,6%
Primary, Secondary Education	Mild	1	2	50%
	Moderate	1		50%
Secondary Education	Mild	30	37	81%
	Moderate	7		19%
Secondary Education, High School	Mild	35	40	87,5%
	Moderate	5		12,5%
High School	Mild	29	32	90,6%
	Moderate	3		9,4%

Relationship between age and vocal disability

The data in Table 3 and Figure 2 show that, in all age groups, the majority of cases of vocal disability are mild, exceeding 77%. In addition, moderate cases are under-represented and only the over 50-age group has severe cases, although in a low proportion.

Table 3. Contingency Table Age vs. Vocal Incapacity Index (VHI-30) score

Current Age (years)	Vocal Incapacity Index (VHI-30) score	Quantity	Total	Percentages
Between 22 - 35 years	Mild	46	59	78,0%
	Moderate	13		22,0%
Between 36 - 49 years	Mild	85	106	80,2%
	Moderate	21		19,8%
Over $\geq$ 50 years	Mild	71	85	83,5%
	Moderate	11		12,9%
	Severe	3		3,6%

**Figure 2.** Distribution of Vocal Disability by age group

Distribution of Vocal Disability according to biological sex

Vocal disability was compared between men and women. Women presented more vocal problems, especially in the categories 'My voice sounds different throughout the day' and 'My voice gets worse in the evening' (Figure 3). The chi-square test showed no significant difference in the proportion of mild, moderate and severe cases between men and women ($p = 0.054$).



Figure 3. Regression Model for Vocal Disability by Vocal Incapacity Index (VHI-30) and Biological Sex

Discussion

After analyzing the data obtained to assess the relationship between vocal incapacity and perceived PQL among teachers at different educational levels, several patterns and trends were identified, allowing reflection on the interaction between sustained vocal effort throughout the working day and professional well-being.

First, the results obtained in our research, in which the majority of participants reported mild levels of vocal incapacity, are consistent with previous research highlighting the high prevalence of voice disorders among teachers. Several studies have reported that more than 50% of teachers experience some form of dysphonia during their careers (12,13,17).

Secondly, teachers in pre-primary and primary education exhibited higher levels of vocal disability compared to those in secondary and upper secondary education. From an environmental ergonomics perspective, this finding can be interpreted as a consequence of the complex acoustic environment in early education classrooms, where numerous overlapping voices from young pupils contribute to increased ambient noise levels (23). This, in turn, compels teachers to sustain greater vocal effort, in line with the findings of Garnier et al. (24), who described the relationship between the Lombard effect and acoustic contrasts in classroom settings. Conversely, in upper secondary schools, classes consist of older students and generally quieter environments, which reduces the need for teachers to raise their voices, thus lowering the risk of vocal strain and subsequent disorders.

In our study, teachers who reported severe levels of vocal disability on the VHI-30 were aged over 50 years. Furthermore, moderate cases were observed to progress to severe levels over time (Figure 2), consistent with previous studies suggesting a progressive decline in vocal quality with increasing age (26).

Regarding biological sex, female teachers presented a higher incidence of severe vocal disability, with all severe cases corresponding to women. This finding may be related to specific anatomical and physiological characteristics of the female larynx, as noted by Granjeiro et al. (22) However, the low representation of male participants may have limited the statistical power to detect significant differences.

Although the incidence of vocal disability among teachers was high, the Kruskal–Wallis test revealed no statistically significant differences in PQL across the various levels of vocal disability. Therefore, the null hypothesis could not be rejected, indicating that vocal

incapacity alone may not directly influence perceived professional well-being. This aligns with other studies suggesting that job satisfaction and quality of life in teachers have a multifactorial nature, where psychosocial and organizational variables may exert stronger effects (9,19,25).

For this reason, we analyzed sub-variables potentially influencing teachers' PQL. Multiple linear regression analysis identified that the variable with the most negative impact on PQL was "My voice gets worse in the afternoon." In contrast, variables positively associated with higher PQL scores included "Motivation," "Support from my supervisors," "I switch off at the end of the working day," "Ability to detach from work once the job is done," and "Satisfaction with salary." These findings suggest that, while vocal incapacity may contribute to a decrease in well-being, psychosocial factors, such as institutional support and motivation, play a crucial mitigating role, supporting previous research on the importance of these factors in teacher health, satisfaction, and productivity (34,35).

When comparing the distribution of perceived PQL across different types of centre management, no significant differences were observed between public, charter, and private schools in either PQL or vocal incapacity levels. The only significant variation appeared in the item "My organization tries to improve quality of life in my workplace," which scored lower among teachers in public institutions, a result that may reflect resource disparities or differences in organizational culture (11).

The absence of a statistically significant relationship between vocal disability and PQL underscores the multifactorial nature of professional well-being. Motivation, organizational support, and fatigue management emerge as critical determinants. Therefore, preventive and health-promoting interventions targeting teachers' working environments should not be underestimated. It is essential to develop preventive action plans within educational institutions, including specific risk assessments and the integration of ergonomic and psychosocial measures to mitigate occupational risks among teachers (21,28,38).

In this context, organizational strategies could include structured voice rest breaks throughout the working day and rotational teaching assignments across educational levels, particularly to protect early childhood and primary school teachers, who are most affected. Technical measures should aim to enhance environmental ergonomics, such as improving classroom acoustics to reduce vocal overexertion (24,31). Additionally, training programs in

vocal projection, posture, and voice amplification techniques could help teachers manage vocal load more effectively (11).

Access to occupational health surveillance should also be ensured, through regular voice health assessments, functional evaluations and examinations of anatomical structures involved in phonation. In this regard, occupational health nurses play a key role in early detection, referral, and follow-up, promoting vocal health among teachers. Furthermore, health promotion programs emphasizing voice hygiene, ergonomic awareness, and behavioral strategies are essential to prevent chronic vocal strain. Expanding this research may help broaden recognition of voice disorders as occupational diseases beyond vocal fold nodules alone (15,16).

Limitations of the study

The most significant limitation of this study was the non-randomized sample, which may have introduced selection bias. Additionally, the cross-sectional design precluded causal inferences between vocal disability and PQL. Underreporting of severe vocal impairment cases also restricted statistical analysis and correlation testing. To address this problem, the tests could be repeated at the end of the academic year, when a higher incidence of severe cases is anticipated, which would increase the sample size. The small number of male participants also limited sex-based comparisons. Only participants who completed all sections of both questionnaires were included, which may have further influenced sample representativeness.

These limitations highlight the need for more diverse and balanced samples, particularly with regard to biological sex, to facilitate the design of effective prevention and management programs for vocal disorders. Such programs could then be extrapolated to other regions and populations to enhance teachers' PQL.

Future Lines of Research

Future studies should consider longitudinal designs to assess changes in vocal function over time, particularly comparing pre- and post-rest periods to evaluate recovery effects. Research should also focus on environmental and organizational factors, such as noise exposure differences between urban and rural schools, to better understand their impact on

vocal health. Additionally, investigating lifestyle variables, including smoking, alcohol consumption, and other behaviors, could clarify their influence on voice quality and support the implementation of targeted prevention and health education programs in educational settings.

Conclusions

No statistically significant correlation was found between isolated voice impairment and quality of working life (PQL) in the study population. However, the multiple linear regression analysis including all PQL-35 variables indicated that voice disorders can indeed influence teachers' PQL, among other factors, suggesting the need for a multifactorial approach.

The results showed that voice disorders represent a considerable occupational health issue among teachers, affecting women aged 39–49 years and over 50 years to a greater extent, with moderate cases tending to become more severe with increasing age.

No statistically significant differences were identified in the distribution of vocal disability across educational levels. However, there was a tendency for vocal impairment to decrease as the level of education increased. There were also no differences when comparing different types of managements' schools.

Consequently, preventive and health promotion strategies remain essential to improve working conditions and to reduce the incidence of voice disorders in the medium and long term within educational settings. It is crucial to raise awareness of voice care and to foster a preventive culture through the design and implementation of specific monitoring and surveillance protocols for teachers concerning their vocal health and PQL.

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Conflict of interests

The authors declare no conflict of interest.

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APPENDICES

Appendix 1. Sociodemographic variables

Variable	Category
<i>Age (years)</i>	22-35 years, 36-49 years, ≥ 50 years
<i>Biological Sex</i>	Man, woman, others
<i>Level of teaching provided</i>	Early childhood, Primary, Secondary Education, High School
<i>Type of educational institution management</i>	Public, charter, private
<i>Geographical Location</i>	Community of Madrid, City of Valladolid

Appendix 2. Professional Quality of Life-35 (PQL-35) questionnaire and Information sheet

Item	Details
<i>Name of questionnaire</i>	PQL-35 questionnaire
<i>Creator and date</i>	Karasek R., 1989
<i>Country of creation</i>	United States
<i>Spanish validation</i>	Cabezas et al., 2008
<i>Purpose</i>	Professional Quality of Life assessment
<i>Number of questions</i>	35 closed questions
<i>Dimensions assessed</i>	Intrinsic motivation, workload, managerial support
<i>Response scale</i>	1 a 10
<i>Categorisation of answers</i>	Nothing (1-2), Some (3-5), Quite (6-8) o A lot (9-10)

Please mark only one answer and on a scale of 1 to 10 the one that best corresponds to your work situation. Please do not leave any question unanswered:

Question	Nothing		Some			Quite			A lot	
	1	2	3	4	5	6	7	8	9	10
Management Support Factor										
Possibility of promotion	1	2	3	4	5	6	7	8	9	10
My company is trying to improve the quality of life in my workplace	1	2	3	4	5	6	7	8	9	10
Satisfaction with salary	1	2	3	4	5	6	7	8	9	10
Acknowledgement of my efforts	1	2	3	4	5	6	7	8	9	10
I receive feedback on the results of my work	1	2	3	4	5	6	7	8	9	10
It is possible that my proposals may be heard	1	2	3	4	5	6	7	8	9	10
Possibility of being creative	1	2	3	4	5	6	7	8	9	10
Support from my bosses	1	2	3	4	5	6	7	8	9	10
I have autonomy or freedom of decision	1	2	3	4	5	6	7	8	9	10
Possibility to express what I think and what I need	1	2	3	4	5	6	7	8	9	10
Variety in my work	1	2	3	4	5	6	7	8	9	10
Support from my colleagues	1	2	3	4	5	6	7	8	9	10
Intrinsic Motivation Factor										
I am clear about what I have to do	1	2	3	4	5	6	7	8	9	10
Satisfaction with the type of work	1	2	3	4	5	6	7	8	9	10
Motivation	1	2	3	4	5	6	7	8	9	10
Willingness to be creative	1	2	3	4	5	6	7	8	9	10

I am proud of my work	1	2	3	4	5	6	7	8	9	10
Training required to do my current job	1	2	3	4	5	6	7	8	9	10
My work is important for other people's lives	1	2	3	4	5	6	7	8	9	10
Family support	1	2	3	4	5	6	7	8	9	10
I am qualified to do my current job	1	2	3	4	5	6	7	8	9	10
Workload Factor										
Amount of work I have to do	1	2	3	4	5	6	7	8	9	10
Rushing and time pressures	1	2	3	4	5	6	7	8	9	10
Responsibility burden	1	2	3	4	5	6	7	8	9	10
Stress (emotional effort)	1	2	3	4	5	6	7	8	9	10
Pressure I receive to do the amount of work	1	2	3	4	5	6	7	8	9	10
Pressure received to maintain the quality of my work	1	2	3	4	5	6	7	8	9	10
Annoying interruptions	1	2	3	4	5	6	7	8	9	10
My work has negative health consequences	1	2	3	4	5	6	7	8	9	10
Lack of time for personal life	1	2	3	4	5	6	7	8	9	10
Physical discomfort in the workplace	1	2	3	4	5	6	7	8	9	10
Conflicts with other people in my work	1	2	3	4	5	6	7	8	9	10
I switch off at the end of the workday	1	2	3	4	5	6	7	8	9	10
Professional Quality of Life	1	2	3	4	5	6	7	8	9	10
Ability to abstract from the work once the work is completed	1	2	3	4	5	6	7	8	9	10

Appendix 3. Vocal Incapacity Index (VHI-30) and Information sheet

Item	Details
<i>Name of questionnaire</i>	Vocal Incapacity Index (VHI-30)
<i>Creator and date</i>	Jacobson et al., 1997
<i>Country of creation</i>	United States
<i>Spanish validation</i>	Commission of Phoniatrics of the Spanish Society of Otorhinolaryngology (CPSSO), 2007
<i>Purpose</i>	Assessment of the degree of vocal incapacity
<i>Number of questions</i>	30 closed questions (10 questions per dimension)
<i>Dimensions assessed</i>	Functional (F), Physical (P), Emotional (E)
<i>Response scale</i>	From 0 to 4
<i>Categorisation of answers</i>	Never (0), Hardly ever (1), Sometimes (2), Almost always (3), Always (4)
<i>Scoring classification</i>	Mild (0-30 points), Moderate (31-60 points), Severe (61-90 points) or Severe (91-120 points)

Put an 'X' in the box that best represents you for each question:

Functional Category	Never	Hardly ever	Sometimes	Almost always	Always
Part I-F (Functional)					
F1. People hear me with difficulty because of my voice	0	1	2	3	4
F2. People don't understand me in noisy places	0	1	2	3	4
F3. My family can't hear me if I call them from the other side of the house	0	1	2	3	4
F4. I use my phone less than I would like	0	1	2	3	4
F5. I tend to avoid discussions because of my voice	0	1	2	3	4
F6. I talk less to my friends, neighbours and family	0	1	2	3	4
F7. People ask me to repeat what I say to them	0	1	2	3	4
F8. My voice problems disrupt my personal and social life	0	1	2	3	4
F9. I feel displaced from conversations because of my voice	0	1	2	3	4
F10. My voice problem affects my work performance	0	1	2	3	4
Part II-P (Physical)					
P1. I feel short of breath when I speak	0	1	2	3	4
P2. My voice sounds different throughout the day	0	1	2	3	4

P3. People ask me: what's wrong with your voice?	0	1	2	3	4
P4. My voice sounds cracked and dry	0	1	2	3	4
P5. I feel I need to tighten my throat to produce the voice	0	1	2	3	4
P6. The quality of my voice is unpredictable	0	1	2	3	4
P7. I try to change my voice to make it sound different	0	1	2	3	4
P8. I try very hard to speak	0	1	2	3	4
P9. My voice gets worse in the afternoon	0	1	2	3	4
P10. My voice alters in mid-sentence	0	1	2	3	4
Part III-E (Emotional)					
E1. I am tense in conversations because of my voice	0	1	2	3	4
E2. People seem irritated by my voice	0	1	2	3	4
E3. I think people don't understand my voice problem	0	1	2	3	4
E4. My voice bothers me	0	1	2	3	4
E5. Progress less due to my voice	0	1	2	3	4
E6. My voice makes me feel some kind of handicap	0	1	2	3	4
E7. I feel disgruntled when I am asked to repeat what I have said	0	1	2	3	4
E8. I feel embarrassed when I am asked to repeat myself	0	1	2	3	4
E9. My voice makes me feel incompetent	0	1	2	3	4
E10. I'm ashamed of my voice problem	0	1	2	3	4

Appendix 4. QR code Access to questionnaires on site

