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Marcia Simões[I]

Maria do Rosário Dias de Oliveira Latorre[II]

Prevalence of voice alteration among educators and its relationship with self-perception

ABSTRACT

OBJECTIVE: To verify the prevalence of self-reported voice alteration among educators in crèches, and associated factors.

METHODS: This was a cross-sectional observational study carried out in 2000, in eight crèches in the city of São Paulo at which actions within the Crèche Program were being developed. This program formed part of the health promotion activities of a speech therapy investigation laboratory. The data collection was done by means of a questionnaire that was filled out by 93 educators, with questions on sociodemographic characteristics, aspects of the organization and physical environment of the work, habitual voice utilization, history of illnesses, lifestyle and perceptions regarding voice alterations. Assessment of hearing perception was done on the participants' voices. The statistical analysis utilized proportions, central trend measurements, Chi-square test with Yates correction and multiple logistic regression analysis.

RESULTS: Eighty percent of the educators reported that they had voice alterations, although only 26% had sought treatment. A large proportion (39%) reported that they had had their problem for four years or more, that it was intermittent (82%) and that they had it to a slight or moderate degree (74%). They believed that the main cause of voice alteration was their use of their voices (82%), and their principal symptom was hoarseness (54%). Self-reported voice alteration was statistically associated with presence of voice alteration observed during assessment and with having had some guidance on voice usage.

CONCLUSIONS: Adequate perception among educators regarding their voice problems could become an important tool for future work among this population with a view to diminishing the high prevalence of voice alteration encountered.

KEYWORDS: Child day care centers, manpower. Voice disorders, epidemiology. Risk factors. Socioeconomic factors. Working conditions. Occupational health.

[I] Curso de Fonoaudiologia. Faculdade de Medicina. Universidade de São Paulo (USP). São Paulo, SP, Brasil

[II] Departamento de Epidemiologia. Faculdade de Saúde Pública. USP. São Paulo, SP, Brasil

Correspondence:
Marcia Simões
Rua Prof. Wlademir Pereira, 61 casa 3 Villa 6
05386-360 São Paulo, SP, Brasil
E-mail: marciasz@usp.br

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INTRODUCTION

Studies have identified greater presence of dysphonia among teachers than among other professionals. This has also been observed in studies on professional categories attended at voice rehabilitation services.[10,12]

In the United States, teachers present a mean of twice the number of negative vocal symptoms and physical discomfort as presented by professionals with less demand on their voices.[10] In Brazil, teachers who took part in a large study in the State of São Paulo reported a mean of two negative vocal symptoms.[4] There is no consensus in the literature regarding the majority of factors associated with the presence of voice alterations.[9]

Many teachers take sick leave because of voice problems and tend not to seek treatment that might directly resolve the problem. When teachers present voice alterations, this may compromise teaching-learning relationships, since comprehension of the message may be made difficult.[1] Voice problems add to other problems that teachers experience, thereby increasing their difficulties in managing their work, health and lives. Environmental factors and factors relating to organizing the workplace have been little studied in relation to teachers' voices.[14]

It is important that these professionals should be capable of identifying the presence of alterations in their voices. Through this, the chance that they would seek specific treatment would be increased and the development of inadequate adjustments when speaking despite such alterations (a very common situation) would be impeded. The negative adjustments include speaking very loudly and forcefully in noisy environments, using an upper respiratory voice pattern or an inadequate resonance focus, among others. These may lead to overload in the vocal system, thus facilitating the appearance of voice alterations. Early diagnosis would lead to lower impact from the voice alterations over the medium to long term, and would reduce the length of treatment.

National and international studied carried out to investigate the prevalence of self-reported voice alteration have found between 20% and 75% among elementary school, high school and university-level teachers.[4,7,10-12]

Educators of children who attended crèches perform teaching activities, but there are no Brazilian studies on voice alterations among this group. Therefore, the objective of the present work was to investigate the prevalence of voice alterations among crèche educators and their relationship with self-reported voice alterations.

METHODS

A cross-sectional observational study was carried out in 2000 in eight crèches in the city of São Paulo, in which actions within the Crèche Program were being developed. This Program forms part of a speech therapy investigation laboratory for health promotion. Since 1985, this Program has been directing its actions towards work with educators, children and families in the fields of language, hearing, oral myofunctional system, speech, fluency and voice. Among the eight crèches participating in this study, one was administrated and supervised by the municipal authority of São Paulo (PMSP), four were run under arrangement with PMSP and three were supervised by the social assistance coordination office of the Universidade de São Paulo (Coseas/USP). The age range of the children attended in these crèches was from zero to six years.

All the 108 educators at these eight crèches were invited to participate in the research. Fourteen were unable to take up the invitation because of lack of available time outside of working hours. Among the 94 (87%) who were able to participate, it was decided to exclude one subject, because this was the only man in the group. Thus, 93 educators (all women) took part in the study, corresponding to 86.1% of the total initial population.

The educators received explanations about the research and guidance regarding filling out a questionnaire. This instrument was devised using questions relating to sociodemographic characteristics, aspects of the work and the organization of the work, voice use pattern, history of diseases, lifestyle and perception regarding voice alterations. Its objective was to assist in studies involving teachers' voices,* and a validation process for it is underway.

The questionnaire was returned three days later, and the educators underwent individual voice assessment at this time.[3] This assessment was conducted in the crèche itself, in a room that was away from the main activities and therefore more quiet. It was performed by a single speech therapist with experience in the field of voice, who is an author of this paper (MS). Among the various voice parameters evaluated, voice quality was selected as best representing the combi-

*Ferreira LP, coordenador. Questionário para estudo da voz de professores. São Paulo: Núcleo de Estudos em Pós-Graduação da Pontifícia Universidade Católica de São Paulo; 1999.

nation of voice characteristics. Through this, the educators' voices were classified as adequate or altered.

The dependent variable was the presence of voice alteration and the independent variables were the characteristics evaluated in the questionnaire. The Chi-square test with Yates correction was used for investigating associations. Multiple logistic regression analysis was performed using the variables that presented statistical significance in the association test. Odds ratios (OR) were used as the measurement for estimated risk and the Hosmer-Lemeshow test was used to investigate the fit of the multiple logistic regression model. For all the analyses, the significance level utilized was 5%.

This research was granted approval by the Research Ethics Committee of the Faculdade de Saúde Pública of Universidade de São Paulo, and all participants signed a statement of free and informed consent.

RESULTS

The educators' ages ranged from 19 to 56 years, with a mean of 31 years. Their mean length of time in the profession was 6.5 years, and 37% had worked in this profession for nine years or more. They had a high level of education: 49.4% of the educators had completed high school and 36.6% had completed university-level education. The majority of them (97.8%) only worked in one crèche. Around 44% said they made frequent use of their voices in other activities outside of their work, and the main ones among these were in taking care of children (20.4%) and singing in church (17.2%).

Voice alterations were self-reported by 74 educators (79.6%), and 36 of them (48.7%) considered that this alteration was present at the time of the study. Nineteen of the educators (25.7%) had sought treatment, while 20.5% used medications and only 9.5% had sought speech therapy care.

For these professionals, the main causes of voice alteration (more than one cause could be mentioned) were: use of the voice (82.4%), speaking in noisy environments (37.8%) and/or stress (33.8%). Causes related to history of diseases (allergy, infections of the upper airways and colds) appeared less frequently.

Most of the educators believed that their voice problems were intermittent (82.4%). The problems had been present for more than six months (93.2%), and the most frequently reported duration of alteration was four years or more (39.2%). Many of the educators (74.3%) believed that their voice alterations were of slight or moderate degree. Better voice in the morning was cited by 32 educators (43.2%), worse voice in the morning by 30 (40.5%), voice unchanged over the course of the day by 10 (13.5%) and voice varying over the course of the day by two (2.8%). Twenty-two educators (29.7%) had been absent from work because of voice alteration, and the length of this absence ranged from a few hours to five days.

The main negative vocal symptoms cited were: hoarseness (54.1%), tiredness of the voice (51.4%), pitch variation (25.7%) and/or loss of the voice (18.9%). The main negative sensory symptoms were: dryness in the throat (58.1%), throat clearing (48.6%), pain when speaking (29.7%) and/or burning sensation (25.7%). The auditory-perceptive evaluation of the voice identified 79.6% of the 93 professionals with alterations in the quality of their voices. It needs to be clarified that this percentage does not correspond exactly to the educators who reported voice alterations, even though the percentages found were the same.

From the prevalence of voice alterations, the relationship between the educators' self-reported voice alterations and the presence of voice alterations detected by the speech therapy evaluation could be studied. A statistically significant association was found (p=0.0032) and it was seen that, among the educators who reported such alterations, 86.5% really presented them (positive predictive valor), and among those who said they did not have such alterations, 47.4% did not present them in the speech therapy evaluation (negative predictive value). The sensitivity of the instrument utilized was 87% and the specificity was 47%. There was also a statistically significant association between self-reported voice alteration and having received guidance regarding appropriate use of the voice (p=0.0340).

From the multiple logistic regression analysis (Table), self-reported voice alteration was shown to be an independent factor associated with the presence of voice alteration (OR=4.5). The other characteristic selected for the model was the presence of dust, because this also presented an association with voice alteration.

DISCUSSION

The present study was the first in Brazil to analyze the presence of self-reported voice alteration among educators in crèches. Similar studies among teachers working at other teaching levels are more common.[9]

A high prevalence of voice alterations was observed

Table - Result from the final multiple logistic regression* model for the association between presence of voice alterations and related variables. São Paulo, 2000.

Variable	Category	Unadjusted OR	IC (Unadjusted OR)	Adjusted OR	IC (Adjusted OR)
Dust	No	1.0		1.0	
	Yes	3.3	[1.1 ; 9.4]	1.5	[0.4 ; 5.7]
Self-reported voice alteration	No	1.0		1.0	
	Yes	5.8	[1.9 ; 17.7]	4.5	[1.2 ; 17.4]

*Hosmer-Lemeshow test: p=0.9999

among the participating educators, and this result is similar to what was found in two literature reviews in voice alterations among teachers working at different teaching levels.[5,9] This indicates the need for actions among this population with a view to preparing educators for professional use of their voices, in seeking to diminish the occurrence of problems of this nature among these professionals.

An association was verified between self-reported voice alteration and voice alterations observed in the speech therapy evaluation, thus indicating that the educators in this study were aware of their voice problems. These data were not registered in other studies.[2,6,9] The present results indicate the possibility of other approaches towards this population, in which for example an initial screening could be done by the educators themselves. In the light of the sensitivity of 87% and specificity of 47% that were seen, this approach becomes valid, as was seen in an Australian study.[8] In the present study, it was not possible to study the relationship between voice symptoms and voice alterations, since the symptoms were only reported by the educators who self-reported voice alterations on the questionnaire.

The educators studied had frequent opportunities to talk to speech therapists about their doubts relating to voice use. This probably kept them a little more alert to this problem, although it was noticed that the educators sought out the speech therapists to clarify more doubts relating to their work with the children than in relation to concerns for their own health. In other studies, no significant association was found between self-reported voice alterations and the presence of voice alterations detected by speech therapists, but it was observed that many teachers perceived their alterations.[2,6]

Despite the high percentage of educators who reported the presence of voice alterations, it was seen in the present study that few sought treatment, and this finding is similar to what was seen in other studies.[9,12,13] It is believed that this resulted from chronically living with the problem, which led the educators to adapt to the situation by means of negative voice adjustments while using their voices professionally, such as speaking loudly and forcefully. This has also been observed in other studies.[9,12] Moreover, it was observed that most of the educators reported intermittent voice alterations, as was also seen in an American study.[12] This may have made them believe that their voices would always get better naturally, thereby dispensing with any specific assistance. They may not have perceived whether their voices came back worse after each episode, considering that the fundamental factor seemed to be "to have a voice" and not necessarily "to have a good voice". This hypothesis can be reinforced by the observation that most of the participant classified their voice alterations as slight or moderate, i.e. despite the voice alteration, they continued to use their voices in their work, even if the quality of their voices was worse. The altered voice may become the teacher's habitual voice, with the result that the teacher ceases to be concerned about this. Furthermore, there seems to be a belief among teachers that voice problems are inherent to their profession, which may also devalue the possible signs and symptoms.[13]

The fact that the main way in which treatment was sought was through the use of medications suggests a possible association with self-medication and its risks, although the present study did not investigate whether indications for these medications had been given in previous medical consultations. If the practice of self-medication were to be proven, it must be discouraged and such individuals should be encouraged to seek out specialized services.

Considering that the mean length of time in the profession was 6.5 years and the length of time with voice alterations that was most frequently self-reported was four years or more, it was seen that voice alterations were starting relatively early among these educators. This reinforces the idea that the risk factors have a rapid negative impact on the voice when used without preparation.

The data relating to the causes of the voice alterations cited by the educators were similar to what was found in other studies, considering that poor use of the voice is mentioned in the literature as the principal factor responsible for dysphonia among professional users of the voice.[9]

Around half of the educators with self-reported voice alterations said that their voices were better in the morning and worsened over the course of the day, while the other half said their voices were worse in the morning and improved during the day. Another study[13] found similar data and it is believed that this points towards two different groups with regard to voice alterations: one with voice fatigue after prolonged, excessive or inappropriate use, and the other with a possible condition of hypofunctioning of the vocal folds or with laryngeal alterations present that have the result that the alteration in voice quality does not disappear, even after resting the voice.

The voice symptoms reported by the educators in this study were similar to those found in other studies: dry throat, hoarseness, tiredness of the voice, throat clearing and pain when speaking.[9,13] These symptoms are directly related to conditions of excessive or inappropriate use of the voice, and also point out the presence of dust and/or noise in the environment and little hydration during the professional use of the voice.

The absences from work caused by the presence of voice alterations that were seen in the present study were similar to those in other studies conducted outside of Brazil.[10,11,13] This is a worrying situation, since such absences were of the order of 30%. The mean number of days off work or absent appears to be sufficient time for the voice to return to the minimum condition for working, but probably without full recovery, which may make it easier for new alterations to emerge.[1]

In the present study, an association was seen between the presence of self-reported voice alterations and having received guidance for appropriate use of the voice. The statistical significance of this association reinforces the importance of receiving guidance on the appropriate use of the voice. The data suggest that such guidance improved the educators' perception of their voice alterations, although not affecting the occurrence of vocal alteration. It would be important to analyze the content and form of such guidance, to make it effective in diminishing the prevalence of voice alteration among these educators. This guidance should encourage the seeking of treatment, thereby avoiding the gradual onset of negative voice adjustments and accommodation to such patterns among these professionals. It is necessary to involve all the professionals in the institution, and particularly those who are in positions of leadership, since it is not just individual changes regarding voice use that are needed. General modifications relating to all the unfavorable characteristics are also indispensable, and these may include from the routine of daily activities to the physical environment of the crèche itself.

Apart from the benefits educators get from detecting their own voice alterations, such detection is important as a tool for actions to be carried out among larger population groups. These actions must be put into effect in the most rapid and least costly manner for institutions and for the professionals who require them and might benefit from intervention work. Early detection of voice alteration may diminish the amount of time off work, with or without a doctor's note, and the readaptation due to this voice problem. Teachers without voice problems have more choices of work, a factor that must be taken into consideration nowadays. Absence of voice alterations among educators forms part of the appropriate conditions for teaching children.[1]

Through better perception of their voices, teachers may be able to be more active in disseminating this knowledge among other professionals with whom they have contact, which could change the position that voice problems are inherent to teaching.

In the present work, it was observed that the educators with self-reported voice alterations have a 4.5 times greater chance of really having voice alterations, and that this perception is associated with having received previous guidance on voice use. In this light, it is believed that it is of fundamental importance to invest in programs that would ensure such self-perception, thereby speeding up the development of actions and obtaining positive results among this population.

In conclusion, the present study found a high prevalence of self-reported voice alteration among educators in crèches, and this was directly associated with the presence of voice alterations detected by assessments. Having received guidance on appropriate use of the voice was also shown to be associated with the presence of self-reported voice alterations.

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