

Mudanças em comportamentos relacionados com o uso da voz após intervenção fonoaudiológica junto a educadoras de creche***

Changes in behavior associated to the use of voice after a speech therapy intervention with professionals of child day care centers

Marcia Simões-Zenari*

Maria do Rosário Dias de Oliveira Latorre**

*Fonoaudióloga. Doutora em Saúde Pública pela Faculdade de Saúde Pública da Universidade de São Paulo. Fonoaudióloga do Curso de Fonoaudiologia do Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional da Faculdade de Medicina da Universidade de São Paulo. Endereço para correspondência: Rua Prof. Wladimir Pereira, 61 - casa 3 - São Paulo - SP - CEP 05386-360 (marciasz@usp.br).

**Bacharel em Estatística. Professora Titular do Departamento de Epidemiologia da Faculdade de Saúde Pública da Universidade de São Paulo.

***Trabalho Realizado na Faculdade de Saúde Pública da Universidade de São Paulo e Curso de Fonoaudiologia da Faculdade de Medicina da Universidade de São Paulo.

Artigo Original de Pesquisa

Artigo Submetido a Avaliação por Pares

Conflito de Interesse: não

Recebido em 02.06.2006.

Revisado em 12.12.2006; 03.01.2008; 13.02.2008.

Aceito para Publicação em 13.02.2008.

Abstract

Background: preventive programs have been used with teachers with the purpose of lowering the number of risk factors for voice disorders. However, few studies have focused on the effectiveness of these programs. **Aim:** to assess changes in behaviors that are considered, according to the specific literature, as having a negative impact on the voice, during a speech therapy intervention program offered to educators. **Method:** an experimental study where a theoretical-practical program involving the professional use of voice was developed with 26 educators from two day care centers of São Paulo. This program involved five monthly meetings, working up to a total of twelve hours. During the program, topics concerning negative behaviors that affect the voice were discussed. On four of the meetings the educators filled in a protocol, making it possible to analyze the frequency on which they presented those specific behaviors. Later on, scores were given to the answers on the protocol in order to compare the findings during the program. For this comparison the statistical test of Wilcoxon and the linear tendency chi-square test were used. **Results:** the gradual decrease in the use of voice out of work was observed, as well as in speaking with a very low or high pitch voice and in eating excessively before sleeping. There was an increase in the occurrence of coughing in the third application of the protocol. As for the overall monthly averages, statistically significant differences were not found when comparing the four applications of the protocol. The overall average score was of 11.75, which was considered moderately abusive. **Conclusion:** the changes that were observed during the program were interesting, but very restrict which makes one wonder about the real effects of this kind of practice and how much broader changes rely on small individual changes. Actions that involve information about vocal well-being exclusively should be revised.

Key Words: Voice; Voice Disorders; Program evaluation; Child Day Care Centers.

Resumo

Tema: programas preventivos têm sido indicados para diminuir a ocorrência de fatores de risco para alteração de voz em professores, mas poucos estudos têm focado sua eficácia. **Objetivo:** avaliar mudanças em comportamentos considerados na literatura especializada como negativos para a voz, ao longo de programa de intervenção fonoaudiológica oferecido a educadoras. **Método:** estudo experimental onde foi desenvolvido programa teórico-prático abordando uso vocal profissional junto a 26 educadoras de duas creches paulistas. Ocorreram cinco encontros mensais num total de doze horas. Durante o programa foram abordadas questões sobre comportamentos negativos para o uso vocal. As educadoras preencheram, em quatro encontros, protocolo que possibilitou analisar a frequência em que apresentaram esses comportamentos. Após, foram construídos escores que possibilitaram comparar esses achados ao longo do programa, com uso dos testes de Wilcoxon e Qui-quadrado de tendência linear. **Resultados:** observou-se diminuição gradativa no uso da voz fora do trabalho, no falar muito grave ou agudo e no comer em excesso antes de dormir. Houve aumento da ocorrência de tosse na terceira aplicação do protocolo. Quanto às médias gerais mensais, não foram observadas diferenças estatisticamente significativas ao se comparar as quatro aplicações. O escore médio geral foi 11,75, considerado moderadamente abusivo. **Conclusão:** as mudanças observadas ao longo do programa foram interessantes, mas muito restritas, levando à reflexão sobre o alcance deste tipo de prática e o quanto mudanças mais amplas não dependem apenas de pequenas mudanças individuais, o que em geral é preconizado. Ações que envolvam exclusivamente informações sobre bem estar vocal devem ser revistas.

Palavras-Chave: Voz; Distúrbios da Voz; Avaliação de Programas; Creches.

Referenciar este material como:



Simões-Zenari M, Latorre MRDO. Changes in behavior associated to the use of voice after a speech therapy intervention with professionals of child day care centers (original title: Mudanças em comportamentos relacionados com o uso da voz após intervenção fonoaudiológica junto a educadoras de creche). Pró-Fono Revista de Atualização Científica. 2008 jan-mar;20(1):61-6.

Introduction

The vocal alterations, even on individuals that make professional use of the voice, had been always seen as individual health questions and not as alterations possibly related to work, what makes difficult the guarantee for treatment and the implantation of preventive programs.

Amongst the diverse professional categories, teacher presents high occurrence of vocal problems, in a range of 20% to 89% (1). Teachers present the more altered voice, relate more negative vocal symptoms, and believe to have greater limitation in work, reduce his/her social activities because of the voice and more frequently consider changes of occupation due to the voice (2-3). Educators of day-care centers are configured as a little studied group, despite the high prevalence of vocal alterations found in this population (4-5).

Once the high incidence of vocal problems among teachers is detected, the necessity of action to minimize the problem is indicated. Grillo and Penteadó (6) highlight that these actions would have to start in the period of formation of the teacher, and to be extended through the entire career. This point is also justified by the fact that teachers in the beginning of the career present greatest number of negative vocal symptoms, according to recent studies (7-8).

For believing that what lacks to the teacher is mainly information for the adequate use of voice, it has been a practical common of the Speech therapist to give lectures in educational institutions, approaching mainly relative aspects to the vocal welfare. There are few objective data that evaluate this type of practice, besides the fact of these practices being very popular (9-10). What has been observed is that when only informative strategies are used, the results are more limited than the ones when both, informative and practical, strategies are used (7,9,11-13).

Based on what has been displayed, the aim of this study was to evaluate behaviors changes considered negative for the professional use of voice of educators of day-care centers throughout a theoretician-practical program of Speech intervention related to the adequate use of voice.

Methods

This experimental study was approved by the Committee of Ethics in Research of the College of Public Health of Universidade de São Paulo (protocol 989/03) and all the participants had signed

term of free and clarified consent.

Twenty-six educators, with ages between 20 and 48 years (average of 32,9 years, $dp=7,5$), from two day-care centers located in the west region of the city of São Paulo, representing 100% of the available initial population, participated in this study. These day-care centers were selected for this study because of the fact of the two have had participated in a ampler study involving the professional vocal use, in which the present group constituted the experimental group.

The theoretical-practical intervention program for the use of voice were constituted by an initial meeting with four hours of duration and four monthly meetings of follow up with two hours each, in a total of 12 hours. This format was established in set with the coordination teams of the day-care centers, based on their routines and availability.

The theoretical base was widely approached in the first meeting, having all the contents been retaken in the follow-up meetings, always in an interrelated way to the practical that were being proposed. The approached topics were: communication processes, production of the voice, vocal psycho-dynamic, concept of normal voice/adapted voice/modified voice, resistance and vocal plasticity, non-verbal communication, body and voice, importance of hearing, main vocal disturbances that affect the teachers, possibilities/individual limits, concept of vocal welfare, main positive and negative factors for the voice of the teacher, importance of the adequate physical space in the use of voice, favoring techniques for vocal projection, resonance, breath, articulation of speech sounds, vocal resistance, vibration of the vocal folds and cervical prolongation.

During the follow up meetings the fulfilling of the Protocol of Register of Behaviors Related to the Use of Voice translated and adapted from Chan (1994) was requested to the educators. Qualified professional made the translation of the protocol. The adaptation relates to the manner as the protocol was applied. In the original study, the educators would have to fill the protocol every day. In the present study, the educators were invited to fill the protocol monthly, as a reminder of the week in which each meeting has occurred. For each one of the fourteen behaviors related to the use of voice listed in the protocol the educators would have to indicate: "I did not do", "I did a little" or "I did a lot". After the fulfilling, the answers were considered as 0, 1 and 2, respectively, for construction of the scores. From these scores, which could vary from 0 to 28, analysis of the changes of the behaviors along

the program was made. These scores were still divided into quartiles in order to make possible the classification of the behaviors in: abusive discrete (scores between 1 and 7,7), moderate (scores between 7,8 and 14,5), severe (scores between 14,6 and 21,3) and extreme (scores between 21,4 and 28).

The test of Wilcoxon was used to compare the means of the scores of each behavior and the total means, with the means obtained in the first application. The Chi-square test of linear tendency was also used to analyze the linear tendency of the means of each behavior along the four meetings. The softwares Epi Info, version 6.0, SPSS, version 12.0 for Windows and MedCalc, version 7.2.0.2 for Windows were used on the analysis. The adopted significance level was of 5%.

Results

In Table 1 descriptive statistics of the scores of the behaviors related to the use of voice and the comparison between the four applications can be observed. The general mean obtained from the data of the four meetings was 11,75, what corresponds to the classification of moderately abusive

behavior. It is observed that there was no statistically significant difference in the total means of scores obtained from the first application of the protocol in comparison to the other ones that occurred in the subsequent monthly meetings.

The means of each behavior obtained during the four applications and the general average, as well as the statistical analyzes of the linear tendency are presented in Table 2.

It can be noticed that the lowest general mean was with regards to smoking and the highest one with regards to strongly use of the voice in activities of recreation. Significant reduction in some behaviors was observed from the statistical analysis: to use the voice outside of the work, which presented minor occurrence in the last two follow up meetings; high and low frequency speech, which diminished in the last meeting and to eat in excess before sleeping, which diminished only in the third meeting (second application). Increase of cough in the fourth meeting (third application) followed by reduction was observed.

There was a statistically significant linear tendency of the use of the voice outside work and of the too high or too low frequency voice. In the other analyzed behaviors there was not linear tendency statistically significant.

TABLE 1. Descriptive statistics of scores of the behaviors related to the use of voice which data were collected during each follow up meeting.

parameters	1st application	2nd application	3rd application	4th application
mean (SD)	12,2 (3,6)	11,7 (3,5)	12,1 (3,7)	11,0 (3,9)
min-max	6-20	5-19	6-19	4-19
median	12,0	12,0	12,0	10,5
p (Wilcoxon)		0,766	0,688	0,205

TABLE 2. Distribution of the means of each behavior related to the use of voice, obtained along the four follow up meetings, and general mean.

behavior	mean					p (tendency)
	General mean	1st application	2nd application	3rd application	4th application	
Use of the voice in recreation	1,41	1,35	1,64 (0,052)*	1,50 (0,305)*	1,13 (0,134)*	0,092
Loud speech in noise	1,36	1,35	1,40 (0,714)*	1,42 (0,564)*	1,25 (0,796)*	0,134
Fast speech	1,06	1,12	1,08 (1,000)*	1,04 (0,593)*	1,00 (0,593)*	0,126
Irritating foods	0,99	1,15	0,96 (0,206)*	0,88 (0,088)*	0,96 (0,166)*	0,112
Irritating drinks	0,96	0,96	0,88 (0,414)*	1,08 (0,317)*	0,91 (0,414)*	0,164
Loud or low speech	0,90	0,85	1,12 (0,080)*	0,85 (1,000)*	0,78 (0,414)*	0,100
To use the voice outside work	0,85	1,12	0,96 (0,527)*	0,69 (0,045)*	0,63 (0,012)*	0,033
Catarrh accumulation	0,79	0,77	0,56 (0,331)*	1,04 (0,118)*	0,79 (0,782)*	0,244
To cry or to laugh too much	0,71	0,69	0,68 (0,763)*	0,77 (0,617)*	0,71 (1,000)*	0,185
To eat before sleep	0,70	0,81	0,60 (0,014)*	0,65 (0,285)*	0,75 (0,477)*	0,163
High or low frequency speech	0,69	0,85	0,72 (0,439)*	0,69 (0,285)*	0,50 (0,005)*	0,049
Emotional speech	0,64	0,77	0,60 (0,218)*	0,58 (0,342)*	0,61 (0,194)*	0,107
To cough	0,50	0,27	0,32 (0,180)*	0,81 (0,022)*	0,58 (0,053)*	0,660
To smoke	0,16	0,19	0,16 (0,317)*	0,12 (0,157)*	0,17 (1,000)*	0,145

* p (Wilcoxon)

Discussion

The aim of this study was to evaluate changes in behaviors considered negative for the professional use of the voice of educators throughout a program of Speech intervention directed to the adequate use of voice.

The frequency with which the educators that participated in the study mentioned the investigated behaviors throughout four out of the five meetings were maintained the same. As the general mean pointed to a behavior that was classified as moderately abusive, this can mean difficulty for reduction, once that the participants

could be close to the limits imposed by their lives or work situation. If the mean general behavior had been classified as severe or extreme, it could have much more to change. Data that can strengthen this hypothesis is that the isolated behaviors that presented greater occurrence were: to use the voice in activities of recreation and to speak loud in the noise. These behaviors are more inherent to the profession of small children educator, than to smoke or to cough, which were the behaviors mentioned with lower frequency.

A study carried through by Chan (14) found

reduction in the use of the voice and improvement of the acoustics vocal measures after the intervention program. The teachers started to present non-vocal strategies to control children, discontinuing the use of screams, loud speech or speech in the presence of noise. For Grillo (15) and Souza et al. (16) the teachers demonstrated difficulties with the changes of habits and were forgetting, as time went by, the worked contents.

Yun et al. (17) carried through a research with patients with polyps that had been submitted to a three months program that approached the vocal welfare, while they waited for the removal surgery. After the conclusion of the program, important improvement in the vocal quality of the participants was observed, being that for 38% of them the surgery was not anymore indicated. The patients who did not smoke or who presented small polyps were the ones that benefited more. Still thus, they did not observe, between the group that improved and the one that did not improve, significant differences in the reduction of behaviors as to accumulate catarrh, to scream, to speak too much, to drink more water and alimentation habits.

The three isolated behaviors that were less frequent during the program of this research were sufficiently commented during the meetings, due to the great interest of the educators. The use of the voice in excess outside of the work was discussed when it was dealt with the importance of moments of vocal rest. The participants were able to perceive that there are many possibilities to create small moments like this along the day, without prejudice of social life.

Södersten et al. (18) indicate that one of the most important aspects to be accomplished together with this population is the increase of the vocal pauses between the activities.

Too high or too low frequency speech was repeatedly worked in the practical sessions for being an aspect that bothered them and that was easily perceived, mainly when vocal psycho-dynamic and vocal plasticity was approached. As indicated by Roy and Hendarto (19), this was not a study to search for the ideal pitch of every participant, which is strongly questioned on the literature; however, it was a study of adequacy to the developed work activities.

The behavior to eat and sleep soon after roused the interest of the participants as its strong correlation with reflux was pointed. Some educators were able to identify symptoms of this disorder and revealed will to look for medical aid. Despite the great interest for the subject, the reduction of this

behavior was isolated from the second to the third meeting, not being supported until the end of the program. The observed reduction occurred mainly between those educators who had indicated the frequent practice of this behavior. Several times, habits that seem simple to be modified are part of a more complex net of factors. On the other hand, more qualitative changes might have occurred in relation to this behavior; therefore, in the measure where the educators could not change definitively their schedules of meals, they started to mention the practice of lighter nocturnal meals.

The increase in the occurrence of cough in the fourth meeting can be explained by a bigger occurrence of colds in the same period.

Bovo et al. (10) used a protocol similar to the one used in this study, however they had not specifically described the results related to the changes in the behaviors. They indicated that the use of this instrument, which in their case was collected daily, was filled in the morning, in the afternoon and at night. The daily protocol could have been useful as a motivation so that the professors diminished the frequency of the abusive behaviors, what reflected in the improvement of the observed vocal quality.

Many times, the professors have the knowledge about negative aspects for voice and, not therefore, they are able to diminish these aspects or even to eliminate them. Frequently, the professional tasks and extreme daily responsibilities take the educator to prioritize his/her profession, in detriment of his/her quality of life. This happens mainly because of the fact that this profession is still seen as a mission, leading, many times, to unrestricted devotion and justifying sacrifices (20).

Even though the effects of intervention programs are still shown as restricted, it seems to contribute in some degree for the improvement of the voice and for the educator awareness on the presented behaviors and why they are presented (7).

Tavares and Martins (21) suggest that beyond the development of preventive programs some other points should be taken into consideration. Some of these points are: the control of ambient factors and associated illnesses, the periodic examination of larynx and the guarantee of access to specialized and adequate treatment in result of the high prevalence of larynx alterations that have been found in this population.

It is important to highlight that, when an intervention approach of this nature is developed, the evolvement of all school community must be

made possible, in order to be not centered only in individual options and choices of each educator lifestyle (20). This way, it is believed that the changes can be ampler and longer lasting. If there is not a change in the conditions of most collective work, the actions, and consequently the results, will always more be limited (22).

In general, the changes observed in this study were interesting, but still in small number, what perhaps was expected by being a short duration program. The monthly systematic was the only possible one and this can have made the participants despondent and forgetful of the contents. Programs with closer meetings sessions seem to take to more expressive results (23).

The main point to be highlight from the findings of this study is the necessity of collective changes with regards to the fact of the collective factors can intervene in more individual decisions, pointing that the focus of this type of program cannot exactly be individual, but collective.

The data of this study contribute with

evidences for the affirmation that it is not only the information lack that leads to the occurrence of vocal alteration in professors, as Salas et. al (2004) believe. The findings point to a much more complex way, where it is fundamental to consider all the work conditions. The support of the legislation in the area of professional health would be fundamental to better provide the use of voice for educators, as well as greater evolvment of the institutions (15,25).

Conclusion

The observed changes in behaviors related to voice, after the intervention program, were reduction in the use of voice outside of the professional activities and reduction in too high or too low frequency speech. There was reduction followed by increase in the habit alimentation close to sleep time and there was an increase and than reduction in cough occurrence.

References

1. Simões M, Latorre MRD. O. Alteração vocal em professores: uma revisão. *Jornal Brasileiro de Fonoaudiologia*. 2002;3(11):127-34.
2. Roy N, Merrill RM, Thibeault S, Gray SD, Smith EM. Voice disorders in teachers and the general population: effects on work performance, attendance, and future career choices. *J. Speech Lang. Hear. Res.* 2004;47:542-51.
3. Sliwinska-Kowalska M, Niebudek-Bogusz E, Fiszler M, Los-Spychalska T, Kotylo P, Sznurowska-Przygocka B, Modrzewska M. The prevalence and risk factors for occupational voice disorders in teachers. *Folia Phoniatri. Logop.* 2006;58(2):85-101.
4. Sala E, Laine A, Simberg S, Pentti J, Suonpää J. The prevalence of voice disorders among day care center teachers compared with nurses: a questionnaire and clinical study. *J. Voice.* 2001;15(3): 413-23.
5. Simões-Zenari M, Latorre MRDO. Prevalência de alteração vocal em educadoras de creche e sua relação com a auto-percepção. *Rev Saúde Pública*. 2006;40(6):1013-8.
6. Grillo MHMM, Penteadó RZ. Impacto da voz na qualidade de vida de professor(a)s do ensino fundamental. *Pró-Fono Revista de Atualização Científica, Barueri (SP)*. 2005;17(3):321-30.
7. Ilomäki I, Mäki E, Laukkanen AM. Vocal symptoms among teachers with and without voice education. *Logopedics Phoniatrics Vocology*. 2005;30:171-4.
8. Kooijman PGC, Thomas G, Graamans K, de Jong FICRS. Psychosocial impact of the teacher's voice throughout the career. *J. Voice.* 2007;21(3):316-24.
9. Roy N, Weinrich B, Gray SD, Tanner K, Toledo SW, Dove H, Corbin-Lewis K, Stemple JC. Voice amplification versus vocal hygiene instruction for teachers with voice disorders: a treatment outcomes study. *J. Speech Lang. Hear. Res.* 2002;45:625-38.
10. Bovo R, Galceran M, Petruccelli J, Hatzopoulos S. Vocal problems among teachers: evaluation of a preventive voice program. *J. Voice.* 2007;21(6):705-22.
11. Roy N, Gray SD, Simon M, Dove H, Corbin-Lewis K, Stemple JC. An evaluation of the effects of two treatment approaches for teachers with voice disorders: a prospective randomized clinical trial. *J. Speech Lang. Hear. Res.* 2001;44:286-96.
12. Duffy OM, Hazlett DE. The impact of preventive voice care programs for training teachers: a longitudinal study. *J. Voice.* 2004;18(1):63-70.

13. Gillivan-Murphy P, Drinnan MJ, O'Dwyer TP, Ridha H, Carding P. The effectiveness of a voice treatment approach for teachers with self-reported voice problems. *J. Voice*. 2006;20(3):423-31.
14. Chan RW. Does the voice improve with vocal hygiene education? A study of some instrumental voice measures in a group of kindergarten teachers. *J. Voice*. 1994;8:279-91.
15. Grillo MHMM. The impact of a vocal improvement course in a speech language and hearing science prevent context. *Pró-Fono Revista de Atualização Científica, Barueri (SP)*. 2004;16(2):159-68.
16. Souza TMT, Manzoni CRCT, Cunha PF, Clemente F. "A voz é meu instrumento": campanha de sensibilização vocal para educadores do município de São Paulo. *Rev Soc Bras Fonoaudiologia, supl. esp*. 2004:278.
17. Yun YS, Kim MB, Son Y. I. The effect of vocal hygiene education for patients with vocal polyp. *Otolaryngology-Head and Neck Surgery*. 2007;137:569-75.
18. Södersten M, Granqvist S, Hammarberg B, Szabo A. Vocal behavior and vocal loading factors for preschool teachers at work studied with binaural DAT recordings. *J. Voice*. 2002;16(3):356-71.
19. Roy N, Hendarto H. Revisiting the pitch controversy: changes in speaking fundamental frequency (SFF) after management of functional dysphonia. *J. Voice*. 2005;19(4):582-91.
20. Penteado RZ. Relações entre saúde e trabalho docente: percepções de professores sobre saúde vocal. *Rev Soc Bras Fonoaudiol*. 2007;12(1):18-22.
21. Tavares ELM, Martins RHG. Vocal evaluation in teachers with or without symptoms. *J. Voice*. 2007;21(4):407-14.
22. Giannini SPP, Passos MC. Histórias que fazem sentidos: as determinações das alterações vocais do professor. *Distúrb Comum*. 2006;18(2):245-57.
23. Simberg S, Sala E, Tuomainen J, Sellman J, Rönne AA-M. The effectiveness of group therapy for students with mild voice disorders: a controlled clinical trial. *J. Voice*. 2006;20(1):97-109.
24. Salas SWA, Centeno HJ, Landa CE, Amaya CJM, Benites GMR. Prevalencia de disfonia en profesores del distrito de Pampas, Tayacaja, Huancavelica. *Rev. Med. Hered*. 2004;15(3):125-30.
25. Vilkmán E. Voice problems at work: a challenge for occupational safety and health arrangement. *Folia Phoniatr. Logop*. 2000;52:120-5.