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Original Article

Artigo Original

Self-perception, complaints and vocal quality among undergraduate students enrolled in a Pedagogy course

Autopercepção, queixas e qualidade vocal entre discentes de um curso de Pedagogia

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Keywords

Voice
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ABSTRACT

Purpose: To compare the vocal self-perception and vocal complaints reported by two groups of students of the pedagogy course (freshmen and graduates); to relate the vocal self-perception to the vocal complaints for these groups; and to compare the voice quality of the students from these groups through perceptual auditory assessment and acoustic analysis. **Methods:** Initially, 89 students from the pedagogy course answered a questionnaire about self-perceived voice quality and vocal complaints. In a second phase, auditory-perceptual evaluation and acoustic analyses of 48 participants were made through voice recordings of sustained vowel emission and poem reading. **Results:** The most reported vocal complaints were fatigue while using the voice, sore throat, effort to speak, irritation or burning in the throat, hoarseness, tightness in the neck, and variations of voice throughout the day. There was a higher occurrence of complaints from graduates than from freshmen, with significant differences for four of the nine complaints. It was also possible to observe the relationship between vocal self-perception and complaints reported by these students. No significant differences were observed in the results of auditory-perceptual evaluation; however, some graduates had their voices evaluated with higher severity of deviation of normalcy. During acoustic analysis no difference was observed between groups. **Conclusion:** The increase in vocal demand by the graduates may have caused the greatest number and diversity of vocal complaints, and several of them are related to the self-assessment of voice quality. The auditory-perceptual evaluation and acoustic analysis showed no deviations in their voice.

Descritores

Voz
Distúrbios da Voz
Qualidade da Voz
Avaliação
Autoavaliação

RESUMO

Objetivo: Comparar a autopercepção vocal e as queixas vocais reportadas por dois grupos de alunas do curso de Pedagogia (ingressantes e formandas); relacionar a autopercepção vocal com as queixas vocais nesses grupos e comparar a qualidade vocal das alunas desses grupos por meio da avaliação perceptivo-auditiva e da análise acústica. **Métodos:** Inicialmente, 89 estudantes de um curso de Pedagogia responderam a um questionário sobre a autopercepção da qualidade vocal e queixas vocais. Numa segunda etapa foram realizadas análises perceptivo-auditiva e acústica das vozes de 48 participantes, por meio de gravações de emissão de vogal sustentada e leitura de poema. **Resultados:** As queixas vocais mais relatadas foram cansaço no uso da voz, dor na garganta, esforço para falar, irritação ou ardor na garganta, rouquidão, tensão na nuca e variações da voz ao longo do dia. Houve maior ocorrência de queixas entre as formandas, quando comparadas com as ingressantes, mas com diferença significativa para quatro das nove queixas. Também foi possível observar a relação entre a autopercepção vocal e as referidas queixas dessas alunas. Não foram encontradas diferenças significativas nos resultados da análise perceptivo-auditiva, entretanto, algumas formandas tiveram suas vozes avaliadas com maior severidade de desvio da normalidade. Na análise acústica não houve diferença entre os grupos. **Conclusão:** O aumento da demanda vocal pelas formandas pode ter provocado o maior número e diversidade de queixas vocais, sendo que várias delas se relacionaram com a autoavaliação da qualidade vocal. As avaliações perceptivo-auditiva e acústica não mostraram desvios na voz.

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INTRODUCTION

The voice is the main and most important instrument of work for a teacher, and therefore it is vital that these professionals have a healthy and pleasant voice. It is not sufficient to just master the theoretical contents, because a monotone voice of weak intensity may result in indifference and drowsiness of the listeners. On the other hand, a hoarse, rough, and very strong voice may have an unpleasant impact on the listener, resulting in not only indifference, but dispersion, which may affect the interaction between student and teacher and, consequently, the learning of the undergraduate[1-2].

The teacher should work in favorable environments with favorable situations for the development of educational activities; however, it was observed that the working conditions of this population are precarious; most teachers work for long hours, in crowded classes with a lot of competitive noise, besides other factors unfavorable to communication[3]. Many are the factors that determine and interfere in the vocal health, among which, the incorrect or abusive use of the voice, physical and environmental factors, psychological and emotional factors, intrinsic factors, and inappropriate vocal habits. The studies involving teachers have the objective of understanding the impact of those factors on the voice of this population to aware them, so that they can use their vocal tract as good as possible and take care of their vocal health[1-3].

National and international analyses involving teachers showed a high rate of symptoms and vocal changes in this professional category. Within the vocal and laryngeal symptoms most commonly found among teachers, the hoarseness, loss of voice, weak voice, burning sensation or irritation of the throat, feeling of dry/scraping throat, tiredness to speak, lack of air to speak, voice failure, coughing, throat clearing, difficulty in the emission of high pitched sounds, vocal fatigue, difficulties in vocal projection, effort to speak, weak vocal intensity, voice breaking, and difficulties on being heard are the ones that stand out[4-10]. An epidemiological study pointed out risk factors for the voice of professionals working as teachers, such as the presence of alteration in the vocal folds in childhood and/or adult life, frequent throat infections, allergies, being a current or former smoker, having hearing problems, developing professional activities that require great vocal demand, in addition to hobbies and leisure activities that require high vocal demand[9].

Particularly, at national level, there are reports indicating that teachers, when compared to other nonteaching professionals, present approximately twice the risk of having voice disorders, establishing, thus, the high occupational risk for this professional class. This risk seems to be higher among female teachers. The symptoms of higher interference in the professional activities of the teachers were the increased effort, discomfort, difficulty in projecting the voice, and vocal fatigue[11]. Besides this information, the literature also indicates investigations addressed to teachers who aim at the vocal improvement of this population[12-15]. Despite the alcances in studies on the voices of teachers at a national level, the studies directly related to the voice of undergraduate university students are still limited.

College students preparing to become teachers also have vocal complaints[16] and more vocal alterations when compared to other college students[17]. Researchers who investigated this population state that these students should have greater knowledge on the risk factors that favor vocal alterations[18]. They also pinpoint the importance of investigations focused on future teachers who attend the pedagogy course and other degrees, as well as the need for preventive actions on the voice, to prevent dysphonia in this population[16,19-23]. Also, the literature emphasizes the importance of undergoing, already at undergraduation, a laryngological examination and a voice quality evaluation, focusing on the need of tracing actions on health education for undergraduate students, once those will act out as voice professionals[11,16,22-24].

Studies directed to the survey of vocal self-perception and vocal complaints among undergraduate students enrolled in a pedagogy course, as well as the investigation of voice quality through perceptive and acoustic perception of this population, are still limited in the literature. Besides, it is interesting to verify whether or not educational activities conducted as a part of professional formation (internships or conducting activities) of undergraduate students enrolled in a pedagogy course may interfere in the voice quality of this population. Studies in this direction may contribute to establish preventive actions and vocal health promotion, as well as contribute to the vocal improvement of this professional category.

The objectives of this research were to compare vocal self-perception and, also, the vocal complaints reported by two groups of undergraduates, both freshmen and seniors; to relate the information obtained on vocal self-perception with those obtained on vocal complaints for both groups; and to compare the vocal quality of these two groups though the auditory-perceptive evaluation and the acoustic analysis.

METHOD

The study was approved by the Research Ethics Committee of the School of Philosophy and Sciences at Universidade Estadual Paulista (Unesp) in Marília, São Paulo, which was carried out under endorsement No. 0841/2010. All participants signed the informed consent before taking part in the study. All recommendations in Resolution 196/96 of the National Health Council were followed.

This cross-sectional observational research comprised undergraduate students enrolled in a pedagogy course, who were distributed into two groups: Group 1 (G1), exclusively consisting of first-year undergraduate students who were not taking part in activities involving the professional use of the voice; and Group 2 (G2), consisting of fourth-year undergraduate students who attended to mandatory internships that demanded constant use of the voice. The population studied was formed exclusively by female undergraduate students, which is justified by the fact that the population of students of pedagogy is primarily formed by female students.

The research was developed in two stages and the data were collected at the end of the first semester of the school year. The first stage aimed at surveying information on the vocal

self-perception and vocal complaints of G1 and G2, through the use of a questionnaire. In this stage, 89 undergraduate students participated, considering 47 of them were enrolled in the first year of the course, aged between 18 and 62 years and mean age of 21.81 years, with standard deviation (SD) of 7.90 and 42 enrolled in the fourth year of college, aged between 21 and 50 years old and mean age of 25.43 years (SD=7.29). Such instrument of data collection aimed at raising the personal data, information related to the self-perception of voice quality and complaints.

The self-perception of vocal quality was measured by a five-level Likert scale, graded from the left extremity with the phrase "very good voice" to the right extremity, "very bad voice". The undergraduate students were oriented to quantify the perception of their voice and take notes on the scale. For the analysis of results, we considered the value 1 for the answer "very good voice", and "very bad voice" received 5 points.

The vocal complaints were surveyed through closed questions addressing the following complaints: tiredness in the use of voice, sore throat, effort to speak, irritation or burning of the throat, voice loss, throat clearing, hoarseness, foreign body sensation in the throat, tension on the neck, and voice variations throughout the day. For each complaint of the questionnaire, the participants signaled their occurrence and frequency: none, sometimes, often, and permanently.

The second stage of the study verified the vocal quality of the participants in G1 and G2 through the auditory-perceptual evaluation and the acoustic analysis. For that, the voice of the undergraduate students of both groups was recorded to further perform the auditory-perceptive evaluation and the analysis of the acoustic parameters of the vocal quality. Forty-eight undergraduate students took part in this stage; of them, 26 were in the first year of college and 22 in the fourth year, who previously answered to the questionnaire and who had availability to participate in the activities proposed for the second stage of the study. The recordings were previously scheduled with the students. The voice recordings were conducted in an acoustically treated room located in the educational institution where students were enrolled. The Marantz recorder, model PMD660, and the SENNHEISER microphone, model E855, placed in a pedestal at 45º and 3 cm of distance from the subject's mouth were used. The recording was made with the emission of the sustained vowel "a" in usual frequency and intensity. Then, they performed the reading of the poem "*Ou isto ou aquilo*" ("Either this or that") by Cecília Meirelles[25].

For the auditory-perceptual evaluation of the vocal quality, the GRBAS scale was used[26], which consists of a four-point scale (0–3) used to identify the deviation degree of the parameters related to the voice (absent, discrete, moderate, and severe) and each letter identifies a parameter to be analyzed: G (grade), R (roughness), B (breathiness), A (asthenia), and S (strain). In this study, only the G parameter was of interest as it aimed at identifying the presence or absence of alterations in the voices of the students.

The auditory-perceptual evaluation of the G parameter in the GRBAS scale was carried out by three speech language therapists, experts in the voice field. For that, a protocol of notes regarding the perception of voice quality was developed. Also, a compact disc (CD) containing all voice recordings of the students when reading the poem was made. The organization of the recorded voices was randomly selected. Besides, a total of 20% (n=9) voices were randomly repeated in the CD. From these nine repeated recordings, five belonged to students from the first year, and four to the last year of the pedagogy course. This procedure was used as a methodological resource aimed at the intra-rater analysis of the vocal quality evaluation. Thus, the final edition included a total of 57 voices (48 recordings + 9 repetitions) to be evaluated by the speech language pathologists. The CD containing the recordings of the voices of the students when reading the poem and the protocol were given to the speech language pathologists for further auditory-perceptive evaluation.

The auditory-perceptual evaluation was performed in consensus among three speech language pathologists who listened to the voices individually, but at the same time filling out their evaluations. After choosing, the answers were checked. When the opinions were different regarding the vocal quality of the analyzed voice, the judges would listen to the voices again and discuss until defining, together, which would be the adequate scoring.

The acoustic parameters were analyzed from the recording of the emission of the sustained vowel "a" using the PRAAT program, which is a program for acoustic analysis and speech synthesis developed by Paul Boersma and David in the Department of Phonetics of the University of Amsterdam. The acoustic measures presented by this program that were considered important for this study were the following: pitch (Hz), local jitter (%), local shimmer (%), and harmonic-to-noise ratio (HNR) (dB). Considering that PRAAT does not present values of normality, we can use, similarly to those results found by this program, values reported by other softwares[27]. In this study, the results obtained by the PRAAT software were anchored by those reported by the Multi-Dimensional Voice Program software (Kay Elemetrics), which presents the following values: pitch or F_0=241.08 Hz; local jitter (%)≤0.633, and local shimmer (%)≤1.997. As for the HNR, values close to 20 (dB) may be considered, according to what was presented by Dr Speech software (Tigers DRS Inc.).

Data analysis

The data obtained in this study were presented descriptively and through an inferential statistical analysis. For the comparison of the results on the vocal self-perception reports presented by G1 and G2, the Student's t-test was used. For the comparison of the results on vocal complaints presented by both groups, the test of equality of two proportions was used. Thus, the categories of answers "no" and "yes" were considered, so that in the "yes" category we included the answers sometimes, often, and permanently.

To verify the relation between self-perception and vocal quality and the presence or absence of vocal complaints reported by the students, the analysis of variance (ANOVA)

test was applied. To compare the G values between the two groups, obtained by the auditory-perceptive evaluation, the equality of two proportions test was used. For the comparison of vocal quality obtained through the received value of the G parameter in the auditory-perceptual evaluation scale and the acoustic analysis, between the two groups, the ANOVA test was used. The Kappa agreement rate was used to verify the intra-rater agreement in the auditory-perceptive evaluation of the voices of the participants. This test was applied using the answers obtained in the consensual judgment of three speech language pathologists, when evaluating the repeated recordings in the CD.

RESULTS

The answers of the college students regarding the self-perception of their voices are described in Table 1.

After filling out the vocal self-perception, the students took notes of their vocal complaints and the data are presented in Table 2.

Table 3 presents the relation between self-perception of vocal quality and the presence of vocal complaints reported by the students.

Table 4 presents the results of the auditory-perceptual evaluation, the G parameter of the GRBAS scale, of the voices of

Table 1. Vocal self-perception of freshmen and senior students of the pedagogy course

Vocal self-perception	First year (n=47)	Fourth year (n=42)
Mean	2.77	1.71*
Standard deviation	0.81	0.60
Minimum	1	1
Maximum	5	3

*Statistical significance (p<0.05); Student's t-test

Table 2. Comparison of vocal complaints between freshmen and senior students of the pedagogy course

Complaints	First year		Fourth year		p-value
	n	%	n	%	
Fatigue in the use of the voice					
No	33	70.2	12	28.6	<0.001*
Yes	14	29.8	30	71.4	
Sore throat					
No	18	38.3	18	42.9	0.662
Yes	29	61.7	24	57.1	
Effort to speak					
No	33	70.2	18	42.9	0.009*
Yes	14	29.8	24	57.1	
Irritation or burning in the throat					
No	18	38.3	8	19.0	0.046*
Yes	29	61.7	34	81.0	
Voice loss					
No	37	78.7	29	69.0	0.298
Yes	10	21.3	13	31.0	
Throat clearing					
No	31	66.0	22	52.4	0.193
Yes	16	34.0	20	47.6	
Hoarseness					
No	19	40.4	16	38.1	0.822
Yes	27	57.4	26	61.9	
Sensation of foreign body in the throat					
No	33	70.2	28	66.7	0.719
Yes	14	29.8	14	33.3	
Neck tension					
No	25	53.2	20	47.6	0.600
Yes	22	46.8	22	52.4	
Voice variations throughout the day					
No	30	63.8	17	40.5	0.028*
Yes	17	36.2	25	59.5	

*Statistical significance (p<0.05); Equality test of two proportions

Table 3. Relation between the mean values of vocal quality self-perception and vocal complaint of freshmen and senior students of a pedagogy course

	First year		Fourth year	
	No	Yes	No	Yes
Fatigue in the use of the voice				
Mean	2.67	3.00	1.50	1.80
Standard deviation	0.78	0.88	0.52	0.61
p-value	0.202		0.143	
Sore throat				
Mean	2.56	2.90	1.50	1.88
Standard deviation	0.62	0.90	0.62	0.54
p-value	0.165		0.042	
Effort to speak				
Mean	2.58	3.21	1.50	1.88
Standard deviation	0.75	0.80	0.51	0.61
p-value	0.012		0.042	
Irritation or burning in the throat				
Mean	2.50	2.93	1.25	1.82
Standard deviation	0.71	0.84	0.46	0.58
p-value	0.077		0.012	
Voice loss				
Mean	2.70	3.00	1.55	2.08
Standard deviation	0.85	0.67	0.51	0.64
p-value	0.310		0.007	
Throat clearing				
Mean	2.71	2.88	1.55	1.90
Standard deviation	0.82	0.81	0.51	0.64
p-value	0.515		0.053	
Hoarseness				
Mean	2.47	2.89	1.44	1.88
Standard deviation	0.70	0.75	0.63	0.52
p-value	0.064		0.016	
Sensation of a foreign body in the throat				
Mean	2.82	2.64	1.64	1.86
Standard deviation	0.85	0.74	0.62	0.53
p-value	0.505		0.277	
Neck tension				
Mean	2.72	2.82	1.55	1.86
Standard deviation	0.68	0.96	0.60	0.56
p-value	0.684		0.089	
Voice variation throughout the day				
Mean	2.57	3.12	1.59	1.80
Standard deviation	0.77	0.78	0.51	0.65
p-value	0.024		0.264	

*Statistical significance (p<0.05); ANOVA test

Table 4. Auditory-perceptual evaluation values (G parameter) of the voice of students in the pedagogy course (first and fourth years) performed by the speech language therapists

Evaluation		Mean	Median	Standard deviation	Minimum	Maximum	p-value
G	1st year	0.65	1.0	0.63	0.0	2.0	0.717
	4th year	0.73	1.0	0.77	0.0	2.0	

ANOVA test

the students in the first and fourth years of the course carried out by three speech language pathologists, showing as a basis the mean and median values.

When analyzing more thoroughly the evaluation of the parameter G of the GRBAS scale, in relation to the severity degree, it was possible to observe that no voice was evaluated with severity degree 3. The voices of the freshmen students were classified as G_0 (11; 42.3%), G_1 (13; 50%), and G_2 (2; 7.7%), and the voices of senior students as G_0 (10; 45.5%), G_1 (8; 36.4%), and G_2 (4; 18.2%). The ANOVA test presented p-values equal to 0.827 in G_0, 0.343 in G_1, and 0.274 in G_2 in the comparison between the groups of students.

There was intra-rater agreement on the consensual opinions obtained for the auditory-perceptive evaluation of the voices of the students (64%; p=0.008), which was classified as good.

Table 5 presents the mean values of the acoustic measure of the voices of college women who took part in the recordings.

Table 5. Acoustic measures of the voices of students of the first and fourth years of the pedagogy course

Acoustic measures	School year	Mean	Standard deviation	Minimum	Maximum	p-value
Pitch (Hz)	1st	219.6	33.9	103.2	265.1	0.157
	4th	205.9	31.7	135.0	272.8	
Local jitter (%)	1st	0.335	0.119	0.187	0.616	0.896
	4th	0.340	0.137	0.177	0.691	
Local shimmer (%)	1st	1.82	0.70	0.98	3.54	0.913
	4th	1.80	0.51	0.85	2.93	
HNR (dB)	1st	23.51	3.34	16.50	29.49	0.615
	4th	23.03	3.13	14.20	27.71	

ANOVA test (p<0.05)

Caption: HNR = harmonic-to-noise ratio

DISCUSSION

This research investigated two groups of students of a pedagogy course, being one group formed by freshmen students (G1) and another, by senior students (G2), with the objective of verifying the vocal self-perception, the vocal complaints reported by the students, as well as the results of the auditory-perceptive analysis and the acoustics of the vocal quality of their voices.

When observing the results, in relation to the self-perception of the voice, a significant difference was verified between the students of the first and fourth years in relation to the perception they have of their voice (p<0.05). The mean values of voice self-perception of the two groups show that the group of senior students comprises the ones who signaled an indicative value of lower vocal quality when compared to the group of students in the first year; however, it cannot be stated from this result that both groups consider their voices to be of very bad quality. When observing the results in Table 1, it is verified that among the students of the first year there was one or more students who signaled the worst value for their voice, a fact also shown in the standard deviation of the sample. A study showed that the vocal self-evaluation was reported as bad in only 12% of a population of teachers, considering that most participants evaluated their own voice as good or reasonable[28]. Some studies that used vocal self-evaluation protocols along with teachers point out the fact that even when having complaints related to the voice, they do not notice an impact on their quality of life[29]. Studies suggested a consensus exists between the class of teachers that some symptoms suggesting vocal alterations are part of the profession due to the time of vocal use, work environment conditions, and the daily life stress itself[28,29]. The results found in the research once presented suggest that senior students (students who have started their internships in classrooms) start having vocal perception similar to the one of teachers, that is, it is natural to have some vocal variation determined by use demand, as shown by the literature[28,29].

As for vocal complaints, it is observed that the ones more often reported by the participants of both groups were sore throat, irritation or burning of the throat, and hoarseness. Considering the complaints reported by 50% or more of the participants, it is observed that the students in the first year report sore throats, irritation or burning of the throat, and hoarseness, whereas the ones in the fourth year indicate irritation or burning of the throat, fatigue in the use of the voice, hoarseness, variations of the voice throughout the day, sore throat, effort to speak, and neck tension. In the comparison of both groups of students, a significant difference was observed in the complaints of tiredness in the use of the voice, effort to speak, irritation or burning of the throat, and voice variations throughout the day. Prevalence studies on vocal complaints among pedagogy students reported more throat clearing, sensation of pain or knot on the neck, tense or tired voice[9], and also, hoarseness[16]. The results of this study point out, also, to the increase in the amount and type of vocal complaints indicated by the students of the last year of the course, which suggests that this change may have occurred because these undergraduate students have initiated their internship activities in teaching. These results agree to those of the study in which higher prevalence of vocal complaints was found between students of the third year of undergraduate teacher, which, according to the authors of the study, coincided with the beginning of the internship activities[16].

It is noteworthy that there is no significant difference between the participant groups in relation to hoarseness complaints. Approximately half the students, from both the first and the fourth year, reported having hoarseness. This finding is in accordance with other studies in which hoarseness seems to be one of the most common complaints between students of pedagogy and other undergraduate courses, future voice professionals[9,19]. Hoarseness seems to be a vocal complaint always pointed out by this population, regardless their professional use. When comparing the vocal complaints of these students with the ones of teachers, it is observed that many complaints

most often reported by the students (hoarseness, irritation or burning of the throat, fatigue in the use of the voice, and effort to speak) were also reported by the teachers[4-6,8,30].

The vocal self-perception of students was related to the vocal complaints, considering that among students of the fourth year there was a significant relation to the reporting of hoarseness, voice loss, irritation or burning of the throat, sore throat, and effort to speak. These complaints were also pointed out by students of courses for future teachers in another study[9]. The same relation was significant in the complaints of voice variation throughout the day and effort to speak among the students of the first year. These data may be confronted with the findings of a previous study[18], once that the interpretation of the findings points toward a relation between vocal complaints of future teachers and the results of self-referred scores in the Vocal Handicap Index scale, suggesting that the worse the score achieved, the higher the relation with vocal complaints.

Considering that the values attributed by speech language therapists to the G parameter in the GRBAS scale, in the auditory-perceptive evaluation, it may be observed that the mean of the two groups were close to degree 1, which corresponds to a slight vocal alteration. When comparing the groups as for their distribution of the G values in this scale, no difference was observed between them. However, it is noteworthy that approximately 20% students of the fourth year have the value 2 of the G parameter, which corresponds to moderate voice alteration. This result evidenced an increase in the severity of the voice alteration degree, if we consider that these students, the seniors, in little time will enter the work scenario. Other studies also referred that the vocal alterations are frequent among future teachers[16,17].

In relation to the intra-judge concordance for the judging of the voice quality, the results showed a rate considered good during the judging of the voices of the students enrolled in the pedagogy course, indicating coherence between answers.

As for the acoustic analysis, no significant difference was observed between the mean and median values of pitch, jitter, shimmer, and HNR among the voices of both participant groups. Besides, the values found for the acoustic measures may be considered within normality patterns, even if obtained by a program different from the one reporting normality values. Also, studies with Brazilian women's voices, with laryngological exams without alterations and without vocal complaints, using the same program of acoustic analysis presented the values of pitch at 210 Hz (DP=20.17), local jitter at 0.426 (DP=0.148), local shimmer at 2.964 (DP=2.199), and HNR at 19.332 (DP=3.88)[27].

It is important to note that, although students presented a slight alterations during the auditory-perceptual evaluation considering the mean values, the same did not occur in the analysis of the acoustic parameters.

CONCLUSION

In this study, the undergraduates of the pedagogy course classified the quality of their voices, ranging from very good to good, discarding, thus, the perception of some kind of vocal alteration. No significant difference was observed between the answers obtained by the freshmen and senior students. As for the vocal complaints, a significant difference was found between the undergraduates, with more reports of fatigue in the use of the voice, effort to speak, irritation or burning of the throat, and voice variations throughout the day by the senior undergraduates.

A positive correlation was found between the self-perception of voice quality and hoarseness, loss of voice, irritation or burning of the throat, throat clearing, and effort among the senior undergraduates who presented higher number of vocal complaints. Positive correlation between vocal self-perception and vocal complaints was only found, for freshmen undergraduates, when complaints were presented on voice variation throughout the day and effort to speak.

In the auditory-perceptual evaluation, low or null severity degree was observed for most of the voices judged and no difference was observed between the evaluations of freshmen and seniors. The parameters of acoustic analysis do not show difference in voices of students of both groups, remaining within the normality limits.

In general, the results of the study show that the stages initially developed by undergraduate students of the pedagogy course may result in the increase of vocal demand, which is reflected by the vocal complaints presented by this population and, thus, deserve attention.

**EMGF participated in the elaboration of the project, coordinated the research, participated in the execution of the project, the analysis and interpretation of the data, and also in the preparation and review of the manuscript; SFR took part in the execution of the project, collected and prepared the data, participated in the analysis of the data, and also in the preparation of the manuscript; VCCM participated in the execution of the project, analysis and interpretation of the data, and also in the preparation and review of the manuscript; MLM participated in the execution of the project, collected and prepared the data, participated in the data analysis, and also in the preparation of the manuscript; SMMO participated in the elaboration and execution of the project; LTS participated in the elaboration and in the execution of the project, and also in the review of the manuscript.*

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