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Brief communication

Voice handicap in undergraduate speech-language-hearing students: Exploring its correlation with shyness

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ABSTRACT

Purpose: to analyze the correlation between self-perception of voice handicap and the degree of shyness in university students.

Methods: an observational cross-sectional study including students over 18 years old enrolled in the speech-language-hearing program at a public university. Participants were invited to answer an online form, which included an identification form with questions on gender, age, and education, the Check and Buss Shyness Scale, and the reduced Voice Handicap Index (VHI-10). Data were analyzed descriptively and statistically. The Spearman's Correlation test, the Mann-Whitney test, and the Pearson´s Chi-Square test were used for statistical analysis, all with a 5% significance level.

Results: 144 university students, of whom approximately 28.5% had some degree of shyness, were included. Likewise, approximately 25% of them reported perceiving a voice handicap. Shyness was significantly moderately correlated with perceived voice handicap ($\rho = 0.445$; $p < 0.001$); these two variables were also statistically significantly associated ($\chi^2 = 21.0$; $p < 0.001$).

Conclusion: shyness is related to voice handicap in speech-language-hearing university students. It can significantly influence their communication and should be included as a relevant variable in improving vocal and communicative skills.

Keywords: Voice; Shyness; Students; Communication

Study conducted at the Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brasil.

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INTRODUCTION

Shyness is a behavioral pattern that occurs when interacting with another person, especially someone who is not familiar[1,2]. It is a common human personality trait manifested by behavioral, somatic, and cognitive symptoms[3]. It is not considered a disease, with an estimated prevalence of 70% in the world population[1,2]. It can be defined as discomfort or inhibition in social interactions caused by possible negative consequences. A shy person may suffer from anticipation of a negative judgment, which compromises their ability to achieve both professional and personal goals[3]. This behavior is more intense in some people – i.e., they feel shy in more situations, sometimes causing inhibition and social anxiety[4].

Vocal quality and shyness are interconnected in several ways and can significantly impact a person's communication and expression. Shy people tend to speak with a low-pitched voice, tremors, and restricted articulation, and complain of xerostomia and body tremors[5].

The fear of being noticed leads shy people to speak with low intensity, which can influence speech intelligibility and interfere with effective communication. Due to social anxiety, shy people often experience muscle tension, which can affect the speech articulation system, causing closed articulation, with a tense, rough, unstable vocal quality. In general, vocal quality can be negatively affected by muscle tension, and the voice may sound less natural and fluent, possibly contributing to feelings of insecurity[4].

Other nonverbal aspects may also be compromised, such as lack of voice projection, accelerated speech, and lack of eye contact with the interlocutor. These factors impact the speech and the effectiveness of the message, as they reduce communication expressiveness[4].

Shyness can inhibit emotional expression, and shy people may avoid variations in intonation and other expressive aspects of speech, which can result in a monotonous and inexpressive vocal quality that compromises how the interlocutor interprets their messages. Shy students are less likely to participate in public activities, make voluntary contributions, and are more inhibited than non-shy students[6]. During academic life, communication skills are required mainly in oral presentations, since this will be important for undergraduates in their future work environment, regardless of their field[7].

Communication between healthcare professionals and patients influences adherence and treatment success, since most interpersonal relationships are established through communication. Effective communication helps establish bonds, which is essential for understanding the complaint and performing good clinical reasoning[8].

Speech-language-hearing (SLH) therapy can valuably help shy people improve their vocal quality and overcome barriers in communication situations. The relationship between vocal quality and shyness is multifaceted and complex. Considering the importance of communication skills for social and professional interactions, it is essential to understand how shyness can influence a person's vocal self-perception. This study aimed to analyze the relationship between self-perception of voice handicap and the degree of shyness in university students.

METHODS

This is a cross-sectional study with quantitative data analysis. The research was approved by the Research Ethics Committee of the Deolindo Couto Neurology Institute (INDC) of the Universidade Federal do Rio de Janeiro, RJ, Brazil, under approval number 5,149,099 and CAEE 52908221.9.0000.5261. Data collection only began after the participants consented by signing an informed consent form. The inclusion criteria were students over 18 years old from all terms of the SLH program at a public university. Participants who did not respond to all questionnaires were excluded. The research used an online form created in Google Forms and disseminated on social media and other channels linked to this institution's SLH students.

This study complied with human research ethical standards, following the principles established in the Declaration of Helsinki and meeting the guidelines of Resolution no. 466/2012 of the National Health Council of the Brazilian Ministry of Health. All procedures were approved by the Research Ethics Committee and performed after obtaining informed consent, ensuring respect for the participants' dignity, integrity, and rights.

Participants were asked to answer an online form with questions on gender, age, and education, the Check and Buss Shyness Scale, and the reduced Voice Handicap Index (VHI-10)[9]. The Check and Buss Shyness Scale[10] assesses the presence or absence of shyness in participants with 13 questions on communication in everyday situations. To complete the scale, participants were instructed to select an answer

according to the 5-point Likert scale, with 0 indicating "completely disagree", and 4 indicating "completely agree". The score is calculated by the simple sum of the answers and can range from 0 to 52 points. This study defined the presence of shyness based on the Shyness Scale assessment: participants with a score below 34 were classified as not shy (value "No"), while those with a score equal to or greater than 34 were classified as shy (value "Yes"). Thus, the sample was divided into two independent groups, shy and non-shy.

The VHI-10[10] was also used with 10 questions to assess self-perception of voice handicap. Each question can be answered on a Likert scale, where 0 means "never", and 4 means "always". The score is calculated by simply summing the answers and can range from 0 to 40, with 0 indicating no perception of voice handicap, and 40 indicating the greatest perception of voice handicap. The instrument's cutoff score is 7 points – i.e., people with a score above 7 are considered to have self-perceived voice handicap[10]. These scores define the values "Yes" and "No", respectively, of the self-perception of voice handicap.

The data were tabulated and analyzed using descriptive and inferential statistics, using SPSS 25.0 software. A 5% significance level was adopted for all inferential statistical analyses.

Continuous quantitative variables such as age, Shyness Scale, and VHI-10 were analyzed descriptively by calculating their mean, standard deviation, and median, as well as the current ordinal quantitative variable in the academic term. Nominal qualitative variables such as gender, age group, term, presence of shyness, and self-perception of voice handicap were analyzed descriptively by frequency and percentage.

The Shapiro-Wilk test was used to determine whether the variables had a distribution similar to normal. The distribution of the variables was analyzed with the Shapiro-Wilk test to compare the quantitative variables according to the two independent groups (shy and non-shy). All of them had a non-normal distribution. Therefore, the non-parametric Mann-Whitney test was used to compare these variables between the two research groups.

Also, due to the non-normal distribution of the variables, the correlations between the Shyness Scale, VHI-10, and the academic term were performed using Spearman's correlation coefficient (ρ). The degree of correlation between the variables was considered greater the closer they were to -1 or 1, with correlations being negative or positive, respectively.

Lastly, Pearson's Chi-Square test was used to test the association between the nominal qualitative variables: presence of shyness and self-perception of voice handicap.

RESULTS

The study included 144 students with a mean age of 25.3 ± 5.06 years and a range of 18 to 53 years.

Table 1 shows the frequency of responses and percentages of gender, age group, term, shyness, and self-perceived voice handicap. Hence, 87.6% of research participants identified as females, and most participants were 18 to 22 years old. Data were collected from university students from all terms, although with a greater participation of students from the initial (1st to 4th term) than the final undergraduate term (5th to 8th).

Table 1. Description of the frequencies of responses and percentage of gender, age range, academic term, presence of shyness, and self-perception of voice handicap

Variables		N	%
Gender	Females	127	87.6
	Males	17	11.7
	Non-binary	1	0.7
Age range	18-22	75	52
	23-27	56	39
	28-31	5	3.5
	32-35	1	0.7
	36-40	4	2.8
	41-51	3	2
Academic term	1st – 2nd	37	25.7
	3rd – 4th	47	32.6
	5th – 6th	41	28.5
	7th – 8th	19	13.2
Presence of shyness	No	103	71.5
	Yes	41	28.5
Self-perception of voice handicap	No	108	75
	Yes	36	25

Captions: N = number of response frequency; % = frequency in percentage

Table 2 shows the Spearman's correlation coefficients for the crossing between the Shyness Scale, VHI-10, and the term. A significant ($p < 0.001$) and moderate ($\rho = 0.445$) Spearman's bivariate correlation was found between the Shyness Scale and the VHI-10, indicating that the higher the participants' level of shyness, the greater their self-perception of voice handicap. This reinforces the influence of shyness on self-reported vocal perception in the study group. However, no statistically significant correlation was found between the Shyness Scale and the academic term ($p = 0.450$), nor between the VHI-10 and the term ($p = 0.818$). This suggests that academic advancement is not relevantly related to shyness or the perception of voice handicap.

Table 2. Spearman's correlation coefficient (ρ) for the crossover between the Shyness Scale, Vocal Handicap Index -10, and academic term

Variables		Shyness Scale	VHI-10	Term
Shyness Scale	P	—	0.445*	0.064
	p-value	—	< 0.001	0.450
	N	—	144	144
VHI-10	P	0.445*	—	0.019
	p-value	< 0.001	—	0.818
	N	144	—	144
Term	P	0.064	0.019	—
	p-value	0.450	0.818	—
	N	144	144	—

Captions: Spearman's correlation; ρ = Spearman's correlation coefficient; p-value = p-value, significant for $p \leq 0.05$;
* = p-value when significant; N = number of students evaluated.

The gender was not considered for analysis due to the discrepancy between men and women participating in the research.

Table 3 shows the comparative analysis between shy and non-shy students, demonstrating that both the Shyness Scale scores and VHI-10 scores differed significantly between the groups ($p < 0.001$). This confirms higher levels of shyness and self-perception of voice handicap in shy participants. Age was also significantly different ($p = 0.009$), indicating that shy students tend to be slightly older. The academic term ($p = 0.807$) did not vary between the groups, corroborating the absence of a relationship between shyness and progress in the program.

Table 3. Analysis of variables of the Shyness Scale, Vocal Handicap Index -10, academic term, and age regarding the shy and non-shy groups

Variables	Presence of shyness	N	Mean	Median	Standard deviation	p-value
Age	No	103	24.81	24	4.69	0.009*
	Yes	41	26.66	25	5.73	
Term	No	103	4.13	4	2.8	0.807
	Yes	41	4.27	4	2.9	
Shyness scale	No	103	23.55	25	6.69	< 0.001*
	Yes	41	38.93	39	3.52	
VHI-10	No	103	3.35	2	4.9	< 0.001*
	Yes	41	10.88	8	9.95	

Captions: Mann-Whitney test; p-value = p-value, significant for $p \leq 0.05$;
* = p-value when significant; N = number of students evaluated.

In Table 4, which presents the association between the presence of shyness and self-perception of voice handicap, Pearson's chi-square test ($p < 0.001$) indicated a statistically significant association between the variables. Of the 144 participants, 36 (25%) were classified as shy, and, among these, 58.3% had voice handicap. On the other hand, 81.5% of the 108 (75%) non-shy participants did not report voice handicap, suggesting a higher prevalence of self-perception of voice handicap among shy participants than non-shy ones.

Table 4. Association between the presence of shyness and self-perception of voice handicap

Variables			Presence of shyness		p-value
			No	Yes	
Self-perception of voice handicap	No	N	88	20	< 0.001*
		%	81.50	18.50	
	Yes	N	15	21	
			41.70	58.30	

Captions: Pearson's Chi-Square Test; p-value = p-value, significant for $p \leq 0.05$;
* = p-value when significant; N = number of students evaluated; % = percentage

DISCUSSION

Voice handicap is characterized as the harm or negative effect that vocal changes can generate in a person's life[11]. Shyness has characteristics that affect their speech and communication[3]. As seen in the literature, shy people may have a voice handicap due to the effects of shyness, rather than any vocal change[12].

A study with a similar sample showed that shy university students are more likely to be afraid of public speaking and to participate less in activities involving communication. They also presented negative self-assessment of their speech, low loudness, and accelerated speech rate[13]. Another study compared shy and non-shy people and demonstrated an association between shyness and self-perception of weak vocal intensity[14]. The findings in the literature are corroborated by the results of this study. Shyness significantly influences a person's communication and speech, impacting vocal performance during oral expression. Thus, the data indicate that higher levels of shyness are associated with a greater self-perception of voice handicap. Shy people self-assess the negative aspects of public speaking more highly than the positive aspects and have a weaker voice intensity than non-shy people. The greater the perception of shyness, the greater the self-assessment of negative aspects of speech and communication[15].

Many professions require good communication, especially in the corporate environment, where it is considered essential for good professional performance. Structured speech with defined objectives is necessary for efficient communication[16]. This skill can be impacted by shyness, which, in addition to the effects on the person's voice, such as weak intensity and unstable voice, also affects nonverbal aspects that can interfere with the effectiveness of communication.

A study aimed to correlate anxiety and communicative performance through auditory-perceptual evaluation during tasks with sustained vowels, linked speech, and speech at the time of anxiety. It found that the higher the score on the State-Trait Anxiety Inventory (STAI), the greater the evidence of anxiety during speech, which led to resonance imbalance and impaired vocal modulation, speech articulation, and facial expression. There is evidence that anxiety can cause communication problems such as a higher-pitched voice or breaks in frequency, laryngopharyngeal resonance, shallow breathing, increased muscle tension during phonation, vocabulary restriction, disfluency, and so on[17]. Anxiety can be intensified in shy people with or without vocal changes since shyness compromises the effectiveness of communication and, in some cases, is associated with social anxiety, which makes it even more difficult to produce clear and efficient speech.

Teachers, regardless of vocal complaints, have psychological symptoms and a greater perception of voice handicaps than professionals without complaints. Those who reported vocal complaints also reported symptoms such as xerostomia, acidic taste in the mouth, indigestion, and gastric discomfort. Moreover, participants with vocal complaints showed signs of anxiety at the time of the survey, which may compromise the effectiveness of communication in the professional context[18].

Slightly shy scores predominated among the shy participants. This shyness can affect professional life due to the market's increasing demands for good communication. In the social aspect, these shy people date less, feel lonelier, explore social situations less, and express themselves less[19].

SLH students are exposed to risk factors for developing vocal problems. Approximately 11% of students have diagnosed vocal problems, another 11% speak with loud intensity and have high vocal loading, in addition to contact with environmental factors such as alcohol, passive smoking, stress, and few hours of sleep[20]. These factors may be related to self-reported voice handicap in non-shy students and influence the voice handicap of shy people.

These data indicate that most SLH students do not fit the profile of shy people. This result may be related to the characteristics of the program and the profession, which require developed communication skills, since they are dedicated to caring for human communication. Thus, shyness can directly influence the choice of career, keeping shy people away from SLH therapy. The fact that most of these students have lower levels of shyness can contribute positively to their performance in undergraduate studies and future career since they are more likely to have a lower perception of voice handicaps and fewer negative impacts on communication than those with higher levels of shyness.

Around 58% of shy students had a voice handicap, which shows that shyness has an impact on the perception of vocal quality. The lack of significant difference between the academic term and shyness suggests that progress in the program did not influence shyness. These data indicate that the decrease or increase in shyness is unrelated to the advancement in undergraduate studies. There was a significant

(though small) correlation between shyness and the participants' age. This may suggest that a slight increase in shyness with age is possible. The gender was not analyzed due to the predominance of female SLH students, corresponding to around 90% of the sample. This discrepancy prevented the analysis of the relationship between gender and shyness among the participants.

A limitation of this study was that the participants were from a single higher education institution. Furthermore, the sample was recruited by convenience, which compromises the possibility of generalizing the results to the target population. Hence, future investigations should include larger and more representative samples and use more comprehensive vocal evaluation procedures, including the diagnosis and auditory-perceptual evaluation of vocal quality. Lastly, the results may help improve communicative strategies aimed at reducing voice handicap in people with shy traits.

CONCLUSION

The results of the present study indicate a significant association between shyness and the perception of voice handicap in SLH university students, evidenced by a moderate positive correlation and the higher prevalence of voice handicap among shy participants. Shy people had a significantly higher probability of reporting voice handicaps. The comparative analysis between shy and non-shy students revealed statistically significant differences in the Shyness Scale and the VHI-10, confirming that shyness may be associated with the self-perception of voice handicap. However, no significant relationship was found between shyness and progress in the program, suggesting that shyness does not directly influence the students' academic progress. The age of shy participants was slightly higher than that of non-shy participants, suggesting that shyness may manifest or persist in older age groups within the study population.

Shyness appears to be relevant in improving vocal and communicative skills. The most effective approach to improving this relationship involves improving vocal quality and managing shyness, aiming to promote more efficient communication and more confident vocal expression. Thus, SLH pathologists play an important role, offering guidance, training, and support to individuals seeking to overcome the challenges imposed by shyness and impaired vocal quality.

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Authors' contributions:

LH: Conceptualization; Data curation; Investigation; Writing - Original draft.

IM: Data analysis.

AR, SF: Writing - Review & editing.

RD: Conceptualization; Methodology; Project administration; Supervision; Writing - Review & editing.

Data Sharing Statement:

In accordance with the guidelines of the Research Ethics Committee that approved this study, the study's data will not be shared publicly since they contain sensitive and personal information of the participants, whose confidentiality and privacy must be strictly preserved. Access to the data was restricted to the research team authorized for this study, as approved by the ethics report, ensuring full compliance with the current ethical standards for human research in Brazil (Resolution no. 466/2012, CNS/MS).