The Effectiveness of a Voice Training Program for Telemarketers

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Summary: Purpose. To use a randomized design to evaluate the effectiveness of voice training programs for telemarketers via multidimensional analysis.

Methods. Forty-eight telemarketers were randomly assigned to two groups: voice training group (n = 14) who underwent training over an 8-week period and a nontraining control group (n = 34). Before and after training, recordings of the sustained vowel /ɛ/ and connected were collected for acoustic and perceptual analyses.

Results. Based on pre- and posttraining comparisons, the voice training group presented with a significant reduction in percent jitter ($P = 0.044$). No other significant differences were observed, and inter-rater reliability varied from poor to fair.

Conclusions. These findings suggest that voice training improved a single acoustic dimension, but do not change perceptual dimension of telemarketers' voices.

Key Words: Voice–Voice training–Effectiveness–Preventive medicine.

INTRODUCTION

Voice training programs have been previously shown to prevent vocal fold lesions because of voice misuse and abuse, and to improve overall voice efficiency.[1] However, there are few randomized, controlled studies evaluating the effectiveness of these programs,[2–4] particularly for vocally high-risk populations in which the prevalence of aberrant voice symptoms is high, as in telemarketers.[5,6] Such studies overwhelmingly favor the implementation of vocal health promotion programs[7] for the prevention of voice disorders.[8]

A recent review of the literature regarding the impact of such training programs on voice quality revealed 10 related studies.[9] Of the 10 studies, nine reported statistically significant improvement in at least one measure related to voice production compared with baseline. Two of the studies specifically targeted telemarketers.[10,11] Although the results were favorable in this population, neither of the studies met the appropriate methodological criteria to confirm validity, as outlined by the authors themselves who recommended future controlled, randomized clinical trials and an investigation regarding different types of vocal training programs.

The same authors recently published qualitative and quantitative research protocols,[12] which were applied to telemarketers and managers from 13 call centers from the United Kingdom and Ireland.[9] Specifically, the study investigated the context of work and communication demands in telemarketers, performed vocal health assessments, and identified risks and the need for training in this population. From the responses of the online confidential questionnaire completed by 598 telemarketers, 25% of the participants reported poor vocal health behaviors, 25% reported muscle tension symptoms, 11% reported a confirmed diagnosis of underlying their dysphonia, and 10% reported that voice problems impact work. Acoustic analysis confirmed that, at the end of a call, telemarketers' voices may be rough, fatigued, and/or inconsistent with regard to pitch. The authors reported that participation in training reduced the risk of dysphonia, and they recommended vocal training for all telemarketers, especially for those early in their career, and vocally based strategies to reduce or eliminate absenteeism.

The present study sought to evaluate the effectiveness of a voice training program for telemarketers. Specifically, the authors sought to compare telemarketers placed in a training group (intervention) with nontrained telemarketers (control group) on several variables including auditory-perceptual and acoustic parameters before and after training. We hypothesize that a voice training program can help to maintain or improve the telemarketer's voice quality.

METHODS

This present study was approved by the Ethics in Research Committee of the Medical School of University of Sao Paulo in accordance with the ethical aspects recommended by the 196/06 resolution from the National Health Council regarding research involving human subjects (Brazil, 1996). All subjects provided informed consent.

Subjects

Subjects in the present study were telemarketers between 18 and 55 years of age currently performing receptive (those telemarketers sought out by customers), active (those telemarketers seeking out customers), or hybrid telemarketing (a mix of both receptive and active) for at least 6 months.[13] Inclusion criteria included an average of 6 working hours per day. Potential subjects who received previous vocal training were excluded. A telemarketing service company located in the state of Sao Paulo that employed approximately 700 telemarketers was selected for this study.

Data collection

Of the 700 telemarketers currently employed at the company, 229 were considered eligible. The final sample size was

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determined based on the estimated improvement associated with the training program. It was estimated that telemarketers receiving training will display a 50% improvement in the number of vocal symptoms based on previous work by Timmermans.[14] Considering that nontrained telemarketers would display a 20% improvement, a type I error of 5%, and power of 80%, we estimated a sample size of 45 telemarketers in the intervention group and 45 in the control group, totaling 90 telemarketers, but a sample of 120 eligible employees was randomly selected to account for attrition. These professionals were invited to participate in a 30-minute vocal hygiene lecture, which was not a component of the training program. The goal of this lecture was to increase interest in the present study and enhance adherence to the study protocol. During the lecture, the telemarketers were informed of the study and its objectives, and they were given the opportunity to consent to participate at the conclusion of the lecture.

A total of 100 telemarketers (83.3%) attended the lecture, of which 92 (76.6%) consented to participate in the present study. Subjects were then randomly assigned to an intervention group (n = 44) and a control group (n = 48). The intervention group received an 8-week training program, including vocal warms and cooldowns, and tasks to expand the psychodynamic aspects of voice production. To be included in the present study, telemarketers had to attend at least 6 (75%) of the 8 training program sessions that were offered once a week and directed by the voice pathologist responsible for the study. All subjects were evaluated via both perceptual and acoustic analyses, before and after training, as described in the following sections. After the completion of the study, the telemarketers in the control group were provided with the vocal training program, if they were interested.

Procedures

Multidimensional voice evaluation consisted of acoustic and perceptual measures collected before and after training. In addition, some demographic and voice information was obtained to characterize the sample, and to compose matched control and intervention groups, including sex, age, level of education, presence of any voice complaint, sore throat, general propensity to scream or speak loudly, involvement in any activities requiring intense voice use, heartburn, hoarseness waking, stomach pain, frequent colds, food before bedtime, hearing loss, thyroid dysfunction, arthritis, lung disorders, allergies, smoking, former smoking, alcohol use, homemade products for voice disorders, medications in general, and how the telemarketer consider the workplace humidity. Some of them are going to be present on results. Finally, subjects were asked if they have a history of voice problems, and if they received treatment. This final item was used to determine if subjects had received formal or allopathic treatments for laryngitis, infections, or allergies that may have caused voice problems.

Initially, the groups were compared with regard to demographic and voice dimensions. As shown in Table 1, the groups were considered similar. Voice samples were captured directly in a microcomputer. These were stored in *Voxmetria* software (CTS Informática, Brazil) at a sample frequency of 44,100 Hz. The recording took place in a silent room (with noise level under 50 dB) using a headset mono microphone, unidirectional, and with a plane response line (Plantronics Audio 20). The distance between the microphone and the telemarketers' lips was 10 cm for connected speech and 3–4 cm for sustained vowels. For both productions, a 45° mouth to microphone angle was used to minimize the erodynamic articulation noise.[15,16]

Voice samples consisted of a sustained vowel (/ɛ/) at comfortable pitch and loudness for acoustic evaluation, and counting

TABLE 1.
Demographic and Vocal Aspects of Telemarketers in the IG and CG

	IG		CG		Total	
Demographic and Vocal Aspects	N	%	N	%	N	%
Sex						
Male	5	35.7	5	14.7	10	20.8
Female	9	64.3	29	85.3	38	79.2
Escolaridade						
Completed high school	11	78.6	20	58.8	31	64.6
Incomplete higher education	3	21.4	12	35.3	15	31.2
University graduates			2	5.9	2	4.2
Age range (y)						
20–29	5	35.7	19	55.9	24	50
30–39	5	35.7	8	23.5	13	27.1
40–51	4	28.6	7	20.6	11	22.9
Voice complaints	2	14.3	12	35.3	14	29.1
Sore throat	3	21.4	6	17.6	9	18.7
Shouting or talking loudly	4	28.5	14	41.2	18	37.5
Another activity-intensive voice			2	5.9	2	4.2
Voice problem that required treatment	1	7.1	7	20.6	8	16.6