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Factors Influencing Likelihood of Voice Therapy Attendance: Report from the CHEER Network

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Abstract

Objective—To identify factors associated with the likelihood of attending voice therapy among patients referred for it in the CHEER (Creating Healthcare Excellence through Education and Research) practice-based research network infrastructure.

Study Design—Prospectively enrolled cross-sectional study.

Setting—CHEER network of community and academic sites.

Methods—Data were collected on patient-reported demographics, voice-related diagnoses, voice-related handicap (Voice Handicap Index–10), likelihood of attending voice therapy (VT), and opinions on factors influencing likelihood of attending VT. The relationships between patient characteristics/opinions and likelihood of attending VT were investigated.

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Results—A total of 170 patients with various voice-related diagnoses reported receiving a recommendation for VT. Of those, 85% indicated that they were likely to attend it, regardless of voice-related handicap severity. The most common factors influencing likelihood of VT attendance were insurance/copay, relief that it was not cancer, and travel. Those who were not likely to attend VT identified, as important factors, unclear potential improvement, not understanding the purpose of therapy, and concern that it would be too hard. In multivariate analysis, factors associated with greater likelihood of attending VT included shorter travel distance, age (40-59 years), and being seen in an academic practice.

Conclusions—Most patients reported plans to attend VT as recommended. Patients who intended to attend VT reported different considerations in their decision making from those who did not plan to attend. These findings may inform patient counseling and efforts to increase access to voice care.

Keywords

CHEER; voice therapy; speech therapy; voice problems; barriers

Voice disorders are common¹ and profoundly affect quality of life² as well as occupational and social function.³ Therefore, it is important to understand patterns of treatment utilization for voice disorders, which may identify potential areas for targeted improvement. Although voice disorders are often treated medically and/or surgically, behavioral treatment in the form of voice therapy by a speech-language pathologist can be a primary or secondary management approach. Voice therapy may assume many forms, but basic components usually include patient education as well as direct modification of voice production through a variety of techniques.⁴ The overarching aim of voice therapy is to restore the best possible voice, one that meets the social, vocational, and avocational needs of the patient. Using the CHEER network,⁵ we previously examined diagnoses that were commonly reported by patients seeking care for voice disorders, as well as the self-reported likelihood of attending voice therapy by a speech-language pathologist. In this geographically diverse group of patients, the most commonly reported diagnoses were vocal strain, reflux, and benign vocal fold lesions, and overall, 67% of patients reported receiving a recommendation for voice therapy.⁶

Despite positive reported outcomes of voice therapy,⁷⁻¹¹ nearly half of all patients who receive a speech-language pathology recommendation do not attend a voice therapy session.¹² Given that patients who participate in voice therapy may have better treatment outcomes,¹³ it is imperative to recognize and address barriers to participation. Previous investigations have examined issues involved in voice therapy attendance, primarily utilizing telephone surveys and retrospective methodologies.¹²⁻¹⁷ In these retrospective studies, several factors influencing voice therapy attendance and adherence were identified, including a lack of insurance coverage, spontaneous improvement, and difficulties with travel and transportation.¹⁵ Qualitative research has shown that voice therapy is also perceived as being hard.¹⁴

By surveying a diverse group of patients at the time of their initial visit (when voice therapy is first recommended), the patient's initial reactions, potential biases, and understanding of

the “voice therapy” treatment option can be assessed. The objectives of this study were to establish (1) the proportion of patients who received a recommendation for voice therapy by a speech-language pathologist and who planned to adhere to that recommendation and (2) patient-reported factors that influenced their decision to attend voice therapy.

Methods

Data Source and Sample

Of the 24 active CHEER network sites, 10 participated in this study. As previously described,⁶ data collection included patient self-reported sociodemographic factors, diagnoses, and receipt of voice therapy recommendation. We did not have access to provider diagnoses or *International Classification of Diseases, Ninth Revision* codes. Sites were categorized as academic versus nonacademic based on affiliation with a teaching medical school. Completion of laryngology fellowship and availability of speech-language pathologists within the practice were assessed with publicly available information listed on practice websites, with additional inquiries via phone as needed. A total of 170 patients were identified for analysis after exclusion of patients who were missing data on self-reported decision to attend therapy ($n = 79$). To protect patient privacy, patient surveys were assigned a unique identifier. The Duke University and University of Minnesota institutional review boards approved the study. Approvals were also obtained for CHEER sites that required independent approval. Project enrollment began on November 27, 2012, and continued through December 5, 2013, when the recruitment goal was met.

Measures

To collect patient-reported data on diagnoses and treatment recommendations, multiple-choice questions were utilized. Patients were invited by research staff to complete the questions immediately after their provider visits were complete. Providers were not present while patients completed the questions, and patients were informed that their providers would not see their responses and that their responses would not influence their care or relationship with their providers. The cohort in this study includes all new patients that responded “yes” to “Was voice therapy recommended for you at today's visit?” In addition, participants were asked if they were “likely to go to voice therapy?” and what factors influenced their decision to attend. Bivariate analysis was selected as the most effective modeling choice due to the small proportions in several of the response choices. Patients who responded to “I am likely to go to voice therapy” with “agree somewhat” and “strongly agree” were grouped as “likely to go to voice therapy.” Patients who responded “strongly disagree,” “disagree somewhat,” or “neither agree nor disagree” were grouped as patients “not likely to go to voice therapy.” Participants were also asked to select among 14 specific factors that could influence their decision to attend voice therapy. The Voice Handicap Index–10 (VHI-10) was also completed.¹⁸

Participants were asked, “What is your diagnosis? Please mark all that apply.” Multiple options were provided as possible responses, as well as the options for specifying “other” or “not sure.” Study data were collected and managed with Research Electronic Data Capture (REDCap) tools hosted at Duke University.¹⁹ REDCap is a secure web-based application

designed to support data capture for research studies. Data were extracted from the REDCap database and analyzed with SAS 9.3 (SAS Institute, Cary, North Carolina).

Analytic Methods

Bivariate comparisons were used to evaluate socioeconomic factors and the distributions of reported voice-related diagnoses. Factors associated with a voice therapy recommendation were then assessed with a multivariate regression model, controlling for age, sex, race, and educational attainment. Because units (individual patients) were clustered within CHEER sites and a single participant could report multiple factors, generalized estimating equation models with clustered standard errors were used. To optimize model fit and stability, only patient-reported factors in the upper 2 quartiles (ie, the most common) were employed as covariates, although all patients were included in the analysis regardless of diagnosis.²⁰ The generalized estimating equation regression models controlled for individual demographic and clinical covariates, including age, sex, race, education, self-reported factors, and site status (academic and nonacademic). Because income and education were closely collinear and self-reported income can be inaccurate,²¹ we excluded income from our model. Our objective was to identify factors associated with greater likelihood of attending voice therapy.

Results

Description of the Practice-Based Research Network

Participating sites were located in Massachusetts, New York, North Carolina, Oregon, Pennsylvania, Texas, and Virginia. Of the 10 sites, 6 had at least 1 fellowship-trained laryngologist, and 3 others had general otolaryngologists with a practice interest in laryngology. This comprised 30 otolaryngology physicians. The 5 academic sites enrolled a total of 118 patients (69%), and the 5 private sites enrolled a total of 52 patients (31%).

Description of the Population

We observed a predominantly white (82%), higher-income (69% earned >\$40,000), and educated patient population. Of all participants, 68% were female, and over half were .50 years old (66%) and had a bachelor's degree or higher (57%). Vocal strain/excessive tension was the most common patient-reported diagnosis (Table 1). Just under half of the patients reported receiving a single diagnosis (45%). Among patients reporting multiple diagnoses, vocal strain/excessive tension (54%), reflux (36%), and benign vocal fold mass/vocal process granuloma (24%) were the most frequently reported diagnoses.

Voice Handicap Severity and Likelihood of Attending Voice Therapy

The mean VHI-10 total was 19 (SD, 8; range, 2-40). Most (85%) patients indicated that they were likely to go to voice therapy as recommended. This was the case whether their VHI-10 score suggested limited or severe voice-related handicap (Figure 1).

Factors Associated with Greater Likelihood of Attending Voice Therapy

A total of 144 patients (85%) responded that they were likely to attend voice therapy, and 26 patients (15%) indicated that they were not likely to attend voice therapy. Prior history of voice problems did not influence the likelihood of pursuing voice therapy. The distribution of the factors influencing likelihood of attending voice therapy was different across the 2 groups ($P < .0001$), and significant differences among the individual factors ($P < .05$) were noted for “hard to translate to everyday use,” “want to see if problem goes away,” “exercises seem strange,” and “don't understand purpose of voice therapy” (Figures 2 and 3).

Among the patients who responded that they were likely to attend voice therapy, the most commonly reported factors influencing the decision to attend were copay/insurance, reassurance that it was not cancer, and travel. Among the smaller group of patients not likely to attend voice therapy, the most commonly reported potential barriers including being unclear on potential improvement, not understanding the purpose of it, and “voice therapy seems too hard.”

After adjusting for sociodemographic and other patient characteristics, the factors associated with the greatest likelihood of pursuing voice therapy included shorter travel to voice therapy, age (40-59 years old), and academic (vs non-academic) practice type (Table 2).

Discussion

The population described in this study was predominantly white, higher income, and educated, consistent with the characteristics of the overall participants in this national practice-based network.⁶ The majority of patients who reported receiving a recommendation for voice therapy indicated that they planned to attend. Interestingly, even among those who reported a relatively mild voice handicap (ie, VHI-10 scores not typically considered abnormal²²), the majority indicated an intention to attend voice therapy, perhaps reflecting that even a mild vocal limitation was sufficient to motivate these individuals to seek treatment. This finding is consistent with a prior study showing that patients who completed and benefited from voice therapy tended to have lower VHI scores at the start of therapy.¹² Alternative explanations include a desire to see oneself as a “good” or “compliant” patient²³⁻²⁵ or, in the case of the low VHI-10 group, limitations of the VHI-10 that may not have captured the full extent of functional impairment, as in the case of singers,²⁶ who may experience greater difficulty with singing than speaking. Interestingly, although lower adherence to voice therapy has been observed among subjects reporting worse symptoms,²⁷ patients in this study with high VHI-10 scores also indicated a high likelihood of attending voice therapy. These differences may be related to distinctions between intention to complete voice therapy and actual completion of it, or they may reflect cultural, occupational, or other differences in the respondents or the practices in which they were evaluated.

Factors reported to influence the decision to attend voice therapy were distinct among those who indicated that they were likely versus not likely to attend therapy, suggesting that different sets of concerns may play a role in treatment utilization. Among those who indicated that they were likely to attend voice therapy, logistical concerns were common,

such as cost and travel. This is in concordance with prior work identifying concerns about insurance and/or cost as a barrier to seeking voice care²⁸ but is different from other recent findings in which distance to clinic was not associated with adherence to therapy.²⁹ Reassurance that it was not cancer was also reported to be a factor that would influence decision making on seeking voice therapy. Knowledge that the voice problem is not due to cancer could perhaps allow readiness for some patients to address the voice problem itself through voice therapy. In others, ruling out cancer could be the primary motivation to seek care, and the voice disturbance itself may be of insufficient concern to address it. Interestingly, time away from work did not deter subjects from attending voice therapy; in fact, age 40 to 59 years (working age) was associated with greater likelihood of reported plans to attend voice therapy. This is consistent with the burden imposed by voice disorders on occupational function.^{1,30}

Among those who indicated that they did not plan to follow through on the recommendation for voice therapy, themes included not understanding how or whether it would help and that it would be too hard. Travel and insurance denial, 2 factors found in a prior study to account for voice therapy nonattendance,¹⁵ did not figure as prominently in the current study (Figure 3). While these results should be interpreted in the context of the smaller number of subjects who were less likely to do voice therapy, they identify potential opportunities for improved communication with patients. Lack of interest in, or inadequate understanding of, voice therapy also suggests that improved methods for engaging the patient regarding the role and rationale of voice therapy are needed.^{14,29} Empowering the patient through educational programs has been beneficial for first-time hearing aid users.^{31,32} Similar approaches and incorporating shared decision-making strategies in this context could include an overview of the purpose of voice therapy, the process of voice therapy, and the effectiveness of voice therapy for various conditions in the literature.³³⁻⁴⁰

How the voice evaluation was conducted may also influence subsequent follow-up with voice therapy recommendations. Joint assessment by an otolaryngologist and a speech-language pathologist has been associated with greater voice therapy adherence.^{13,29} The greater likelihood of voice therapy attendance in academic versus private practice settings may reflect a more interdisciplinary evaluation or other factors yet to be identified.

A striking finding was that 50% of those not likely to attend voice therapy indicated that it “seems too hard,” as opposed to only 6% of those likely to attend it. Although patients who are undergoing voice therapy do report finding it hard,¹⁴ we did not expect that patients would express this concern prior to embarking on the therapy process. This may reflect preexisting knowledge about voice therapy or reactions to counseling in the relevant visit. In addition to possible differences in how these patients were counseled regarding voice therapy, there may be other patient-specific or psychosocial factors influencing patient decision making regarding treatment seeking⁴¹ or perceptions regarding ability to follow treatment recommendations.^{42,43} Further studies are needed to investigate those possibilities.

Although the findings of this study are intriguing, several important limitations need to be acknowledged. First, because of the cross-sectional study design, we do not know the proportion of patients who ultimately attended voice therapy. A longitudinal study design

would require further resources and would be a valuable future direction of inquiry. Second, we do not have a direct window into what discussions took place or how many years of experience the physician/speech-language pathologist had, what patients' prior experience with voice therapy was, or what opinions physicians had about voice therapy—all of which could have influenced the likelihood of voice therapy attendance. For example, it is possible that patients who indicated that they were unclear on the purpose of, or potential benefit from, voice therapy were reflecting ambivalence on the part of the provider, but we are unable to assess this potential contributing factor. In addition, we are unable to assess whether patient evaluations were multidisciplinary. Third, since patients frequently received multiple recommendations at their visits,⁶ it may be possible that some preferred to start with other recommendations prior to considering voice therapy. Finally, it is not possible for us to determine whether cited barriers (eg, insurance) were perceived or actual barriers.

Despite these limitations, the observations from this study suggest that patients across the symptom severity spectrum are willing to attend voice therapy if it is recommended and that logistical issues, such as cost and travel, may present barriers to care. A minority of patients reported that they would not attend voice therapy even when recommended. For those patients, barriers to seeking care appeared to revolve primarily around concerns regarding the reasons for and effectiveness of therapy. These findings suggest that there may be opportunities for improvement in counseling regarding voice therapy. Interventions to reduce access barriers, such as improved insurance coverage, lower costs, and perhaps new approaches to care (eg, teletherapy⁴⁴), may also improve voice therapy attendance.

Conclusions

Most patients in this cohort from the CHEER network indicated that they planned to attend voice therapy when it was recommended. Patients who intended to attend voice therapy reported different considerations in their decision making from those who did not plan to attend. Being seen at an academic center and being aged 40 to 59 years were associated with greater likelihood of planning to attend voice therapy. Travel distance was reported as an important factor in the decision to attend voice therapy. These findings have implications for patient counseling as well as for potential ways to improve accessibility of voice care.

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Figure 1.
Patients likely to go to voice therapy, by Voice Handicap Index–10 (VHI-10) score.

Figure 2. Important factors (%) influencing decision to do voice therapy, as reported by individuals likely to pursue it (n = 144). * $P < .05$. VT, voice therapy.

Figure 3.

Important factors (%) influencing decision to do voice therapy, as reported by individuals not likely to pursue it (n = 26). * $P < .05$. VT, voice therapy.

Table 1

Description of Population: CHEER (N = 170).

Demographic or Treatment Characteristics	n	%
Sex ^a		
Male	115	32
Female	53	68
Race		
White	139	82
Black	16	9
Other	15	9
Age, y ^a		
18-29	19	11
30-39	16	10
40-49	26	15
50-64	71	42
65+	37	22
Income		
<\$20,000	13	8
\$20,000 to \$40,000	16	9
>\$40,000 to \$60,000	24	14
>\$60,000	91	54
Don't know	26	15
Education ^a		
High school or GED	47	28
Associate degree	25	15
BA, BS (4-y college degree)	48	29
MA, MS (master degree)	35	21
PhD, MD, JD, other doctoral degree	12	7
Diagnoses ^b		
Vocal strain, excessive tension	92	54
Neurologic problem (voice only), neurologic problem with voice and other	6	3
Irritable larynx	23	13
Vocal fold paralysis	33	19
Scarring	8	5
Bowing/atrophy	12	7
Probably benign bump, benign mass or lesion, mass or lesion, vocal process granuloma	41	24
Reflux	61	36
Allergy	28	16
Not sure	18	10
Infection of vocal fold, inflammatory process	8	5

Demographic or Treatment Characteristics	n	%
Other	4	2

^aTwo patients did not report sex; 1 patient did not report age; and 3 patients omitted education history.

^bPatients selected all diagnoses that applied; therefore, total exceeds 100%.

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Table 2

Factors Associated with Greater Likelihood of Pursuing Voice Therapy.

	Adjusted Odds Ratio	95% Confidence Interval	P Value
Race			
White	Reference		
Black	0.67	0.33-1.37	.28
Other	0.28	0.21-0.55	.02
Sex			
Female	1.10	0.71-1.69	.66
Male	Reference		
Age, y			
18-39	Reference		
40-59	1.34	1.24-1.45	<.0001
60+	0.54	0.13-2.20	.39
Education			
High school or GED; associate degree; BA, BS (4-y college degree)	1.25	0.59-2.68	.55
MA, MS (master degree); PhD, MD, JD; other doctoral degree	Reference		
Patient-reported factors influencing decision to pursue voice therapy			
Insurance	1.91	0.38-9.56	.43
Time away from work	0.34	0.13-0.86	.02
Travel	1.75	1.06-2.89	.03
Reassured I don't have cancer	1.24	0.97-1.58	.09
Would rather take pill	0.52	0.25-1.11	.12
Unclear of potential improvement	0.61	0.25-1.49	.28
Site status			
Academic	2.48	2.16-2.86	<.0001
Nonacademic	Reference		