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Psychosocial distress in patients presenting with voice concerns

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Abstract

Objectives—To assess the prevalence of psychosocial distress (depression, anxiety, somatization, and perceived stress) in a consecutive sample of patients presenting with voice concerns, and to qualitatively analyze patient comments on challenges associated with voice problems.

Study Design—Cross-sectional study.

Methods—New patients presenting to a multidisciplinary voice clinic with voice concerns were invited to participate. Respondents (n = 197) completed the Brief Symptom Inventory 18 item scale (BSI-18), the 4-item Perceived Stress Scale (PSS-4), and the Voice Handicap Index 10 item scale (VHI-10). Qualitative analysis was performed of responses to an open-ended question about challenges associated with a voice problem.

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Results—Approximately one-third (32%) of patients met strict case criteria for depression, anxiety, and/or somatic concerns based on the BSI-18. The majority of these patients had no prior diagnosis of depression or anxiety, and degree of distress was not predicted by type of voice-related diagnosis. Perceived stress was elevated among female patients (p=0.02). As expected, scores on the VHI-10 were indicative of concurrent voice-related handicap (mean 19.5, standard deviation 9.4). In qualitative analysis of responses regarding challenges associated with a voice problem, 19 themes were identified (e.g., threat to occupational functioning).

Conclusions—These findings identify a high prevalence of multiple types of distress among patients with voice disorders, representing an opportunity to provide more comprehensive care to this patient population.

Introduction

Perhaps because voice is such an inherent part of the human experience,[1] voice disorders (also known as dysphonia) impact functioning[2] and quality of life,[3] particularly among those who cannot fulfill job responsibilities as a result.[4] Voice disorders are common, with a lifetime prevalence of approximately 30%.[5, 6] The high prevalence of dysphonia has considerable occupational ramifications for the U.S. population, of which 25–30% are professional voice users (e.g., teachers, lawyers, salespeople).[4, 5] Among patients identified as having current dysphonia, over 50% reported having missed work as a result of their voice disorder, and over 75% indicated a prior history of dysphonia,[5] suggesting that atrisk patients may remain at-risk over time. Previous research also suggests that the quality of life impact of dysphonia is comparable to that of chronic diseases such as COPD and congestive heart failure.[3] Most patients with dysphonia report one or more impairments related to their voice, including psychosocial distress.[2]

Prior studies have identified depression, anxiety, and/or other psychosocial distress in patients with different types of voice disorders,[7–9] but the number of papers is small compared to studies of distress in individuals with other medical conditions such as cancer and heart disease[10, 11]. In addition, the reported prevalence of anxiety, depression, and other types of distress varies across different studies. In a study of 44 female patients with either vocal nodules or other hyperfunction-related voice disorders, higher state and trait anxiety scores and somatic complaint scores were observed when compared to normal subjects. Stress scores were also elevated in the hyperfunction-related voice disorder patients, but not in the vocal nodule patients.[12] By comparison, among 47 patients with functional dysphonia, spasmodic dysphonia, or vocal fold paralysis, 64% of patients with vocal fold paralysis reported significant distress (particularly depression, but also anxiety and somatic preoccupation) as did 29% of patients with functional dysphonia.[7] In a different study of 61 patients with functional dysphonia, a markedly higher 57% had mood, anxiety, or adjustment disorders, including anxiety regarding somatic complaints.[9]

Two larger studies have examined stress, anxiety, and/or depression among patients with benign voice disorders. Dietrich et al. examined stress, anxiety, and depression among 160 patients who presented with primary muscle tension dysphonia, benign-appearing vocal fold lesions, paradoxical vocal fold motion disorder, and/or glottal insufficiency. Twenty-five

percent reported elevated stress, 37% reported elevated anxiety, and 31% reported elevated depression when compared to population norms. Diagnostic category had some influence on distress scores, with greatest depression, anxiety, and stress noted among patients with paradoxical vocal fold motion, intermediate levels in patients with muscle tension dysphonia or vocal fold lesions, and lower levels in glottal insufficiency. Women were also noted to have higher stress, depression, and anxiety scores than men even with the use of genderadjusted norms; severity of vocal handicap was not assessed.[8] Siupsinskiene et al. evaluated anxiety and depression in 437 patients with benign voice disorders. They observed mild to severe anxiety scores in 42% of patients, but noted mild to severe depression score in only 19%, with greater anxiety in females. There was also a weak but significant correlation between distress, female gender, older age, and higher VHI scores.[13]

The common themes among the studies summarized above include examination of benign voice disorders and a focus on depression, anxiety, and/or somatic concerns. These studies have demonstrated that a substantial portion of voice disorder patients report significant distress. However, limitations of this research preclude strong conclusions and suggest a need for further research. First, many studies have small samples (less than 70), limiting power and generalizability. Second, in some cases there are limitations in terms of the appropriateness of the diagnostic criteria used and/or measure selection. Third, compared to depression and anxiety, somatization—the tendency to identify and seek care for somatic or physical concerns secondary to psychosocial stress[14]—has only been examined on a limited basis. Somatization among individuals with dysphonia is of particular interest because it has been associated with increased medical utilization, costs, and disability independent of psychiatric and medical comorbidity.[15, 16] Its assessment to date has been through a variety of measures, some of which were psychometrically not well-established, and others of which focused more heavily on personality traits. Finally, prior studies have frequently been limited to particular types of voice disorders, most commonly functional and benign voice disorders,[9, 17–22] limiting the generalizability of the findings.

We aimed to add to the existing literature by assessing a large sample of patients with a broad variety of diagnoses to gain an understanding of the prevalence of distress among all comers to a voice clinic, representing the real day-to-day experience of the practicing clinician. In addition, we examined somatization concurrently with depression and anxiety using a well-established instrument that is not focused on personality traits. Secondarily, we qualitatively characterized patient descriptions of voice-related distress to identify particularly distressing aspects of voice problems that may not be captured by average scores on symptom measures.

The objectives of this study were thus (1) to assess the prevalence of psychosocial distress (perceived stress, somatization, anxiety, and depression) in patients with voice disorders and (2) to characterize common thematic patterns in qualitative patient descriptions of voice-related distress.

Methods

Patients

Consecutive patients presenting to the Voice Clinic at an academic otolaryngology clinic were invited to participate by research staff. Inclusion criteria included patient report of voice concern(s), age >18 years, ability to complete questionnaires and measures independently, and willingness to participate. To maintain broad potential applicability of the findings, eligibility was not limited by diagnosis type. Patients completed the instruments before being seen by a provider. The participation rate among eligible patients was 92%. Relevant information including patient demographic and medical characteristics, past medical history, and voice clinic diagnosis was abstracted from the medical record. All diagnoses were abstracted from the clinic charts as documented by one of two laryngologists, with no independent or separate review, as in previous research.[8, 13] In cases where multiple diagnostic categories were invoked, an inclusive approach was taken and each potential diagnosis was recorded to avoid introducing interpretation bias. For instance, a patient presenting with bilateral vocal fold bowing and compensatory muscle tension dysphonia was included in both of those diagnostic categories.

Instruments and analysis

Overall psychosocial distress, as well as depression, anxiety, and somatic concerns, was assessed using the Brief Symptom Inventory-18 (BSI-18)[23]. The BSI-18 was adapted from the original BSI, which has 53 items, with good test-retest reliability, internal consistency, and construct validity.[24] Although the BSI-18 was initially used with cancer patients, it has since been used in a variety of patient populations[25–27] and has demonstrated strong reliability as well (0.74–0.89 depending on domain).[28] The BSI-18 is written at a sixth grade level and can be completed in approximately four minutes. Population norms are available, as are scores from a variety of medical care-seeking patient populations. The scale is reported as a T-score, which takes into account the population mean and standard deviation, and respondents can be placed at a percentile. Though various lower cutoff scores have been used,[23, 29] the very conservative cutoff of a T-score of 63, which is approximately equivalent to a 90th percentile on community norms, was used to determine *caseness* for this study.[28] To identify patients who scored high on the scale but did not meet the strict criteria for caseness, a cutoff at the 75%ile (equivalent to a T-score of 57) was used to indicate what we considered *high-risk* responses. This cutoff was proposed by Zabora et al. in adult cancer patients presenting to a regional cancer center as a more sensitive and specific cutoff in their population.[23] This latter cutoff was reported to have a sensitivity of 91% and specificity of 93% in their study. The BSI-18 can also be interpreted at the sub-scale level for depression, anxiety, and somatic concerns.

The Perceived Stress Scale[30] was used to evaluate degree of perceived stress, and has been shown to assess stress as a distinct concern from depression.[30, 31] This scale is the most commonly used measure to evaluate stress, and has several different versions, including 14 items, 10 items, and 4 items, which are designed to be contextually nonspecific and understood at a junior high reading level. All versions have been demonstrated to have strong internal reliability (ranging from 0.72 to 0.86) and population norms have been

established.[30–32] The PSS-4 is derived from the four most predictive items from the longer scales and has been shown to have comparable reliability to the 10-item version.[30] We therefore used the 4-item scale to assess degree of perceived stress without unduly burdening participants.

Patient-reported vocal handicap was used as a primary measure of vocal function for this study. The widely used Voice Handicap Index,[33] has been adapted into a closely correlated and also frequently utilized shorter 10-item version (VHI-10),[34] which was used for this study. The VHI-10 has excellent reliability (ranging from 0.88 to 0.97 in voice-disordered patients and in normal subjects)[34] and normative values have been established.[35] Patients are asked to rate their agreement with statements such as “People seem irritated with my voice,” and “I tend to avoid groups of people because of my voice.”

Internal reliability of the scales in our sample was assessed using Cronbach’s alpha coefficient prior to imputation. In instances where scales were incomplete, mean imputation[36] was used if more than 70% of the scale had been completed. Overall, less than 5% of responses to any given item were missing.

Comparison of scores across genders was performed using a 2-tailed student’s t-test; equal variances were not assumed. Because prior work has examined differences in VHI across different laryngeal diagnoses,[3, 37] the workup for some patients was in its initial stages at the time of study participation, and some diagnostic categories were relatively infrequent, we compared scores across only the top three most commonly represented categories. Comparison of scores across the three most common diagnoses in the sample was performed using generalized estimating equations (GEE) with an exchangeable covariance matrix, which allows for the potential overlap of scores in diagnostic groups.[38] Although gender differences were not a primary focus of this study, the GEE analysis was also adjusted for gender to take into account different norms for males and females on the BSI-18 and prior work suggesting different mean VHI-10 and PSS scores across genders.

Qualitative data collection and analysis

Participants were also invited to respond to the open-ended question “What aspect(s) of your voice problems do you find most challenging?.” Thematic categories were created from patient answers by a laryngologist (S.M.), who sorted the various responses into those thematic categories. All patient responses were also independently placed into these thematic categories by a psychology doctoral student (L.M.). For complex answers involving multiple themes, responses were divided into units of meaningful content before being categorized. Inter-rater agreement was assessed with a kappa statistic (0.93). The few items (3.4%) on which there were discrepancies between the two raters were placed into a single dominant category with input from other members of the team, and consensus was reached.

IRB

The study was approved by the University of Minnesota Institutional Review Board (IRB# 1201M9533).

Results

Patient characteristics

One hundred ninety-six patients enrolled in the study, including 111 females (57%) and 85 males (43%). Most reported white race and were married. Typical vocal demand widely varied, with nearly a third reporting routine voice use and another third reporting extensive or extraordinary vocal demand (Table 1). Among all participants, 18% reported a prior diagnosis of anxiety and 17% reported a prior diagnosis of depression. There was some overlap in these categories with a total of 26% reporting any prior related diagnosis, including depression and anxiety. Although space was provided for patients to report other diagnoses, none was reported. Patients' voice-related diagnoses were spread across a wide variety of categories, the most common being muscle tension dysphonia, likely benign vocal fold mass/lesion, and motion abnormality (including vocal fold paralysis/paresis) (Table 2). Some patients were included in more than one diagnostic category, as described above.

Prevalence of Voice Handicap and Distress

Descriptive statistics, alpha coefficients, and tests of gender differences for the vocal handicap and distress measures are presented in Table 3. The alpha coefficients ranged from .76 to .91 and thus were all in the acceptable range. Findings regarding distress prevalence and gender differences are summarized below.

The mean VHI-10 score among 191 respondents was 19.5 (sd 9.4) and Cronbach's alpha was 0.91. Eighty percent of the sample scored above the cut-off of 11 established by Rosen et al. for dysphonia.[35] VHI-10 scores were slightly higher among women (mean 20.8, SD 9.46) than among men (17.7, sd 9.03); when compared using a student's t-test this difference was statistically significant (p=0.03) with a Cohen's d of 0.34, which is a small to moderate effect size[39].

Depression, Anxiety, and Somatization

The mean total BSI-18 score was 9.39 (sd 9.98), which is equivalent to a T-score of 54 (66th %ile) and Cronbach's alpha was 0.89. When divided into domains, all subdomain scores demonstrated good reliability: somatic alpha 0.78, depression alpha 0.84, and anxiety alpha 0.85. Using the criteria outlined above, caseness was identified based on total BSI-18 score in 25 of 196 patients (13%). When each domain was separately examined, 32% of the patients (n= 63) met case criteria either based on overall score or by a score that met case criteria for one or more domains. This included 21% who met criteria for caseness in the somatic subdomain, 15% who met criteria for caseness in the depression subdomain, and 15% who met criteria for caseness in the anxiety subdomain; these groups had some overlap (18%). When the second set of criteria (T score 57) was applied, 51% of the sample (n=99) had high-risk scores on the BSI-18. This included 36% who met the high-risk cutoff for the somatic subdomain, 26% for the depression subdomain, and 21% for the anxiety subdomain. None of the raw BSI scores showed a significant difference between women or men, whether overall or subdomain scores were examined. The likelihood of meeting high-risk (p=0.086) or caseness criteria (p=0.758) was also not significantly different between women and men.

We also examined whether patients who met criteria for caseness reported a history of prior related diagnoses such as depression and anxiety to determine whether we had merely confirmed the presence of distress in patients with known difficulties or newly identified patients at risk. Comparison between reported prior related diagnosis and caseness on BSI-18 showed that 62% (n=39) of 63 patients who met caseness criteria had *not* previously received a related diagnosis. Conversely, 53% (n=27) of 51 patients who did report a prior related diagnosis did not meet caseness criteria on the BSI-18. Among patients who met high-risk criteria, 37% had reported a prior related psychiatric diagnosis.

Perceived Stress

The mean total PSS-4 score was 5.03 (sd 3.27) and Cronbach's alpha was 0.76. PSS-4 scores in our sample were slightly higher in women (mean 5.48, sd 3.38) than in men (4.45, sd 3.03); this difference was statistically significant (p=0.03) with a Cohen's d of 0.32. By comparison, normative scores published by the author of the Perceived Stress Scale, including the PSS-4, derived from mean total scores among thousands of adults in a smoking cessation program, were 4.49 (sd 2.96)[31].

Comparison of scores across common diagnoses

Scores were compared across the three most common diagnoses: muscle tension dysphonia (n= 87), benign-appearing vocal fold lesions (n=42), and motion abnormality (n=38) (Table 4). GEE modeling, which allowed for patients to have more than one diagnosis, demonstrated that patients with a motion abnormality had higher voice handicap scores (VHI-10) than those with muscle tension dysphonia (MTD) (p=0.002) or those with benign-appearing vocal fold lesions (p<0.0001). Conversely, the psychosocial distress (BSI-18) scores of the MTD patients were slightly higher than those in the motion abnormality group, but this difference did not reach significance (p=0.057). No other differences were significant.

Qualitative Analysis of Themes

Nineteen themes emerged from a qualitative analysis of responses to an open-ended question regarding what aspect(s) of the patients' voice problems they found most challenging (Table 5). The most commonly reported themes were (1) problems related to "Singing" (22%), (2) "People don't hear/understand me & Impact on social interactions" (16%), (3) "Threat to Occupational Function" (16%), and 4) "Hard to talk/Talking" (15%). The overtly emotional items, such as "Worry/fear" and "Other Emotions" (e.g., anger, frustration, disappointment, embarrassment) were less frequently mentioned. Because some patients listed multiple units of meaningful content, the total percentages in Table 5 exceed 100%.

Discussion

In this study, we assessed the prevalence of psychosocial distress in a heterogeneous sample of patients with all types of voice disorders. Including a broad range of voice disorders in this sample was intended to complement prior studies in which inclusion was limited to specific diagnoses and/or diagnostic categories. Our rationale for investigating patients at

the time of initial treatment presentation was based on the premise that identification of distress was important to consider early in the patient's care process, even if a diagnosis had not yet been definitively established. Therefore the study was open to all new patients with a voice complaint, and the distribution of diagnoses is broad and in some cases somewhat open-ended.

Voice-related handicap

We selected patient-reported vocal handicap for use in this study because it most effectively represents the perspective of the primary stakeholder, i.e., the patient. Our sample demonstrated considerable self-reported voice-related handicap, as demonstrated by high scores on the VHI-10 compared to normative values.[35] As in work by Rosen et al., we noted higher scores in patients with motion abnormalities than in MTD or benign vocal fold lesions.[37]

Depression, anxiety, and somatic symptoms

The BSI-18 was used for this study because it has been used in a variety of clinical populations[40–44] and allowed assessment of somatic concerns, which are not included in many other scales that assess depression and anxiety. Using criteria to identify both caseness (90^{th} percentile threshold) and high risk (75% percentile threshold), 32% met caseness criteria, and 51% met high-risk criteria on the BSI-18. These rates fall within the range of prior reports on the prevalence of distress in patients with voice disorders.[7–9] When compared to studies that have used the BSI-18 or the 53-item original BSI in other clinical populations, the rates of distress in the voice-disordered participants in this study were comparable to those in various other medically relevant patient populations, such as outpatient cancer patients at the time of registration with a cancer center (24% in patients with heterogeneous cancer diagnoses)[43] and within the first few months following diagnosis (28% in breast cancer patients),[42] and victims of sexual abuse (44%)[44]. Thus, patients presenting with voice problems appear to have a prevalence of co-existing distress that is comparable to that in patients with other major medical conditions and traumatic life events.

The significant overlap across patients who met criteria for high-risk or caseness within the three BSI-18 subdomains was not surprising, particularly given prior work demonstrating relationships between each of the subdomains and the overall score.[45] In our study sample, somatic concerns played a major role in the prevalence of distress, contributing more patients that met caseness criteria than depression or anxiety. Although one of the items in the somatization dimension, "Trouble getting your breath," may be influenced by a voice disorder such as a vocal fold paralysis, the other items would not be typically associated with voice problems, and were also not seen in themes within the qualitative analysis, suggesting that the relatively high prevalence of somatic concerns was not directly driven by the presence of dysphonia.

This finding fits into the context of related work in other studies. Using the Freiburg Personality Inventory, Willinger et al. noted elevated anxiety and somatic-type concerns in patients with dysphonia.[9] Along similar lines, work by Demmink-Geertman and Dejonkere demonstrated that neurovegetative symptoms and complaints, which were similar to those

typically evaluated for somatization, were more commonly reported by patients with muscle tension dysphonia than in controls,[46] and that patients who had voice therapy demonstrated improvement in both voice-related and non-voice-related neurovegetative symptoms.[46, 47] It is conceivable that in this medical care-seeking population, somatic concerns could be more ego-syntonic than those overtly linked to depression or anxiety. Further investigation in this area will necessitate distinction between trait/personality findings and state/symptom findings, particularly because the latter may be more modifiable in the immediate clinical setting. Additionally, longitudinal data are needed to clarify the extent to which these symptoms precipitate or follow the onset of dysphonia. Consideration of medical comorbidity may also be important, although as noted previously, somatization may be an important predictor of medical resource utilization independent of psychiatric and medical comorbidity.[17,18]

The unexpectedly high proportion of patients who scored at high-risk or case levels on the BSI-18 but did not report a prior diagnosis of related diagnoses such as depression and anxiety raises some important questions. This phenomenon may represent unwillingness on the part of patients to report a preexisting psychiatric or psychological problem, or unawareness as to the potential relevance of such information for a voice-focused medical visit. Another potential explanation is the relatively greater contribution of patients who met criteria in the somatic subdomain of the BSI to the pool of patients who met broader case or high-risk criteria but did not report a prior related diagnosis. Somatic disorders have been reported to be less commonly diagnosed than depression and/or anxiety, likely because they are often diagnoses of exclusion and the recognition of somatization by care providers has received much less attention than diagnoses of depression and anxiety.[48] Patients who did report a prior related diagnosis but did not meet high-risk or case criteria on the BSI-18 may have been effectively managed and therefore less symptomatic, or perhaps the BSI-18 did not effectively identify these individuals; the information collected for this study did not allow us to examine these possibilities.

In contrast to findings by both Dietrich et al. and Siupsinskiene et al., who noted a higher prevalence of anxiety than depression using the HADS,[8, 13] we noted roughly equal numbers of patients that met criteria for caseness on the BSI-18 for anxiety and for depression, with somatization accounting for a higher percentage of distress among patients who reached “case” status. When “high-risk” status criteria were applied, we again observed a higher prevalence of somatization, followed by depression, then anxiety. It may be that subtle differences between the HADS and BSI-18 lead to slightly different findings which may add some nuance to the literature with respect to the relative contribution of depression and anxiety to distress among patients with voice problems.

Stress

The mean perceived stress score in our sample was not significantly different from normative scores, indicating that, at least in comparison to a similarly care-seeking population, patients with voice disorders did not on average have markedly increased stress. 23% of patients in this sample had stress scores that deviated from the healthy norm by ≥1

SD, which is comparable to the 25% noted by Dietrich et al. in their study of patients with benign voice disorders.[8]

Gender differences

We observed small gender differences in patient-reported voice handicap and in stress, both of which were slightly higher in women, but not in depression, anxiety, or somatization. These findings contrasted somewhat with those of Dietrich et al. and Siupsinskiene et al., both of whom observed greater anxiety and depression in women than in men, but were consistent with the finding of greater stress among women in the study by Dietrich et al..[8, 13] The latter finding was to be expected, as this study used the same measure, and a gender difference was also seen in large national survey data analyzed by the author of the PSS.[32] The BSI-18 does have gender-specific norms, as does the HADS. We are unable to assess how the use of the BSI-18, as opposed to the HADS used in these prior studies, may have affected the identification of gender-related differences. Although others have speculated that somatic concerns are more commonly observed in women,[49] this was not observed in our data.

Qualitative findings

The themes that emerged from our qualitative data collection were similar to those represented in many of the various existing scales that measure patient-reported voice handicap, voice-related quality of life, or other aspects of voice-related function. As in a prior study examining illness perceptions of people with dysphonia, we identified a wide variety of themes in patient concerns[50]. Despite the high levels of distress we detected, a surprisingly small proportion of patients mentioned anxiety-related symptoms such as worry or fear. The more dominant themes included difficulty with singing, which perhaps reflect the nature of our practice and referral patterns, and concerns related to occupational and social function. The variety of concerns raised by our patients implies that, although common themes were identified, a one-size-fits-all approach would likely be inadequate for addressing the psychological and other challenges experienced by patients with voice disorders. These findings suggest that patients may benefit more from an individualized approach that focuses on specific concerns.

Limitations

These scales were completed at the new patient visit for each subject, and therefore represent a cross-sectional sample. It is unknown how responses might have evolved over time although we plan to examine this in future work. These results do not show causation, but they do identify a high prevalence of distress in this patient population. That a significant proportion of those identified as being high risk by their scores on the BSI-18 do not report a prior psychiatric diagnosis suggests that this may represent a need and an opportunity for broader and more comprehensive patient care.

That the majority of patients responded to a question eliciting commentary on challenges related to the voice problem suggests that the voice problem may be a source of distress, but these data do not allow us to determine whether and/or how much of a given patient's distress was related directly to the voice disorder vs. other life stressors, as well as the extent

to which distress predates the onset of voice disorders, is exacerbated by them, or if the relationship is bidirectional. Responses were gathered before the patients met with voice-team members, and therefore some of the distress may have been related to uncertainty regarding diagnosis and/or prognosis. However, a minority of qualitative responses reflected these concerns, suggesting that they were unlikely to account for the high prevalence of distress in this diverse voice patient population. The themes identified in the qualitative analysis may provide a guide for areas in which patients may particularly benefit from counseling and/or management strategies, particularly if they have a voice problem that may persist over the longer term.

Future directions

Despite the link between voice disorders and distress, psychological care is not routinely incorporated into voice care. A randomized trial of voice therapy found persistent psychosocial distress despite treatment of voice problems.[51] Thus, medical/surgical voice treatment alone may be insufficient for patients with voice disorders. Future work will focus on using information from the distress measures and thematic content identified in our qualitative analysis to improve treatment and management strategies for patients with voice disorders.

Conclusions

We observed a striking prevalence of clinically significant psychosocial distress (including depression, anxiety, and somatic concerns) among a cohort of all comers to a voice clinic, most of whom did not carry a previous related psychological diagnosis. Qualitative analysis identified 19 themes which tended to be focused on function more than emotion despite the high prevalence of psychosocial distress. There appears to be an opportunity and a need for improved detection of concurrent psychosocial distress among patients with voice disorders, potentially leading to treatment approaches that improve function and quality of life for these patients.

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Table 1

Patient characteristics

Characteristic		n	percent
Gender	Male	85	43.4%
	Female	111	56.6%
Race	White	100	51.0%
	Black/African American	6	3.1%
	American Indian/Alaska Native	3	1.5%
	Asian/Asian American	4	2.0%
	Other	3	1.5%
	Not reported	80	40.8%
Marital status	Married	112	57.1%
	Widowed	9	4.6%
	Divorced	25	12.8%
	Separated	2	1.0%
	Never Married	47	24.0%
	Not reported	1	0.5%
Typical voice use	Undemanding	14	7.1%
	Intermittent	38	19.4%
	Routine	62	31.6%
	Extensive	37	18.9%
	Extraordinary	34	17.3%
	Not reported	11	5.6%

Table 2

Voice clinic diagnoses

Diagnostic categories	Females (n = 111)	Males (n = 85)	Total (n=196)	% of total population
Muscle tension dysphonia	50	37	87	44.4%
Bowing/atrophy	7	25	32	16.3%
Motion abnormality (eg paresis, paralysis)	21	17	38	19.4%
Focal laryngeal neurological disorder (eg tremor, SD)	9	3	12	6.1%
Systemic neurological disorder (eg ALS, Parkinson)	2	4	6	3.1%
Vocal fold mass or lesion, likely benign	29	13	42	21.4%
Vocal fold mass or lesion, concerning	4	7	11	5.6%
Vocal fold mass or lesion, known malignancy	0	2	2	1.0%
Irritable larynx syndrome (including chronic cough, throat-clearing, globus not secondary to known trigger such as uncontrolled reflux)	15	9	24	12.2%
Vocal process granuloma	2	4	6	3.1%
Infectious laryngitis (eg fungal, bacterial laryngitis)	3	3	6	3.1%
Inflammatory process (eg sarcoidosis, amyloidosis)	5	2	7	3.6%
Reflux	9	9	18	9.2%
Other (including dysphagia, cervicalgia, sequelae of prior cancer care, etc.)	13	10	23	11.7%

Table 3

Scores on measures of voice handicap and psychosocial distress

Scale	n	alpha	Overall score Mean (SD)	Male Mean (SD)	Female Mean (SD)	t	p
VHI-10 total	191	0.91	19.5 (9.4)	17.7 (9.0)	20.8 (9.5)	2.30	0.02
BSI-18 total	194	0.89	9.4	8.7	9.9	0.83	0.41
Somatic		0.78	3.3 (4.1)	3.5 (3.9)	3.2 (4.3)	−0.40	0.69
Depression		0.84	2.9 (3.9)	2.3 (3.0)	3.3 (4.4)	1.92	0.06
Anxiety		0.85	3.3 (4.1)	3.0 (3.6)	3.5 (4.4)	0.95	0.35
PSS-4 total	195	0.76	5.0 (3.3)	4.4 (3.0)	5.5 (3.4)	2.25	0.03

Table 4

Comparison of scores across three most common diagnoses

Diagnostic category	Scale	Total n Mean (SD)	Male (n) Mean (SD)	Female (n) Mean (SD)
Muscle tension dysphonia		87	37	50
	Total VHI-10	18.0 (9.6)	15.2 (8.3)	20.0 (10.1)
	Total BSI-18	10.2 (10.2)	10.2 (8.5)	10.1 (11.4)
	Total PSS-4	4.8 (3.5)	4.3 (3.1)	5.2 (3.7)
Motion abnormality		38	17	21
	Total VHI-10	24.3 (8.4)[a]	22.0 (8.7)	26.2 (7.8)
	Total BSI-18	7.2 (6.8)	7.6 (8.0)	6.8 (5.9)
	Total PSS-4	4.6 (3.1)	4.0 (3.5)	5.1 (2.8)
Vocal fold lesion, likely benign		42	13	29
	Total VHI-10	16.0 (7.8)[b]	13.2 (8.2)	17.2 (7.4)
	Total BSI-18	9.7 (8.6)	9.9 (7.4)	9.6 (9.2)
	Total PSS-4	5.5 (3.5)	4.8 (8.9)	5.9 (3.7)

[a] significant difference between MTD and motion abnormality group on VHI-10, p=.0002

[b] significant difference between MTD and vocal fold lesion group on VHI-10, p<.0001.

No other differences between diagnostic groups were significant.

Table 5

Qualitative analysis of answers to question, “What aspect(s) of your voice problem are most challenging?”

Thematic Category	% Reporting	Representative Items
Singing	22.1	Not being able to sing
		Interfered with choir performances
People don’t hear/understand me/Impact on social interactions	16.3	People are unable to hear me when talking
		Talking; socializing
Threat to occupational function	15.7	Not knowing if my voice can withstand a leading lady career
		I need a voice at work for my income.
Hard To Talk/Talking	14.5	Not being able to talk normally.
		In joining conversations I'm aware of sounding halting, with gaps in the flow of words.
Fatigue/strain/energy/effort	11.6	Fatigue from forcing voice out.
		Getting tired after talking for a few minutes or so
Hoarse Voice	9.3	When I speak frequently, my voice goes hoarse.
		Good one day, hoarse the next.
Other Emotions (Anger, frustration, disappointment, embarrassment)	8.7	Embarrassing…; frustrating at times!
		Emotionally, it depresses me
Unclear prognosis, uncertainty, unpredictability	8.7	I never know what my voice is going to do.
		Not knowing how to treat it and if it will require surgery
Communication	7.6	To communicate on a daily basis
		Inability to communicate with others
Difficulty in background noise/large groups	7.0	Not being able to converse in large social settings or noisy places
		Talking in crowded areas
Telephone	6.4	Talking on phone
		Communicating on the phone
Loss of Function	6.4	I can't do what I used to do.
		Not having the abilities I used to have.
Throat discomfort/pain	6.4	Burning sensation in my throat when I move/exercise
		The scratchiness
Cough/throat-clearing	4.7	The choking cough
		Have to clear throat often; needs water a lot to clear throat
Identity	4.7	I want to sound like myself
		At worst, people don't know it's me
Other	4.7	Swelling

Thematic Category	% Reporting	Representative Items
		I will have a laryngospasm
Perception of Others	4.7	Makes people think I might be contagious
		People thinking that if I can talk at all, that means my voice is fine
Breathing	4.1	Not getting full breath of air, thinking about breathing
		I lose air in middle of my sentences so I stop to get more air
Worry/fear	4.1	Fear of something VERY wrong
		Afraid it won't get better
Constant Problem	2.9	Chronic; almost life-long
		The persistence of the symptoms