

Association Between Communicative Participation and Psychosocial Factors in Patients With Voice Disorders

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IMPORTANCE Communicative participation can be conceptualized as taking part in life situations in which people are socially engaged. Communicative participation is an important aspect in the lives of patients with voice disorders, although it has not been formally assessed among a broad sample of patients with voice disorders. The associations between communicative participation and associated concepts (vocal impairment, psychosocial distress, and voice-specific perceived control) are unknown yet important for integrated treatment approaches.

OBJECTIVE The primary objective was to examine the associations between communicative participation and vocal impairment, psychosocial distress, and voice-specific perceived control. The secondary objective was to examine whether perceived control moderates the association of distress with communicative participation and vocal impairment, the latter of which would replicate previous research. The hypotheses were that communicative participation would be associated with lower vocal impairment, lower distress, and higher perceived control and that higher perceived control would moderate the association between communicative participation and both vocal impairment and psychosocial distress.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study was conducted from June 2014 to May 2017 among a consecutive sample of adult patients with voice disorders at an academic voice clinic affiliated with the University of Minnesota. Of the 744 patients approached to participate in the survey study, 590 patients agreed. Data analysis was performed from January to June 2020.

MAIN OUTCOMES AND MEASURES Communicative participation (measured by the 10-item general short form of the Communicative Participation Item Bank), vocal impairment (measured by the 10-item version of the Voice Handicap Index), psychosocial distress (measured by the 18-item version of the Brief Symptom Inventory), and voice-specific perceived control (measured by the 8-item present control subscale of the Perceived Control Over Stressful Events Scale).

RESULTS The sample comprised 590 patients (mean [SD] age, 51.9 [17.1] years; 390 women [66.1%]) with voice disorders. Communicative participation was associated with lower vocal impairment ($r = -0.73$; 95% CI, -0.77 to -0.69), lower overall psychosocial distress ($r = -0.22$; 95% CI, -0.30 to -0.14), and higher voice-specific perceived control ($r = 0.30$; 95% CI, 0.23 - 0.37). Moderation analyses indicated that communicative participation was negatively associated with distress at all levels of perceived control and, replicating previous findings, greater vocal impairment was associated with higher psychosocial distress only in patients with lower perceived control.

CONCLUSIONS AND RELEVANCE In this study, communicative participation was associated with, but distinct from, vocal impairment and was also associated with psychosocial distress and voice-specific perceived control. The study's results suggest that communicative participation is an important addition to voice research and clinical care.

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JAMA Otolaryngol Head Neck Surg. 2021;147(3):245-252. doi:10.1001/jamaoto.2020.4956
Published online December 23, 2020. Last corrected on March 18, 2021.

Communicative participation is an important aspect of the experience of patients with voice disorders. Communicative participation can broadly be conceptualized as taking an active part in life situations that involve engagement with others, such as social settings in which knowledge and ideas are verbally exchanged.^{1,2} Individuals with medical problems that affect speech and voice are at risk of reduced communicative participation³⁻⁵ if they cannot adequately convey their thoughts to others and develop interpersonal connections.⁶ Although communicative participation is conceptually associated with vocal impairment (ie, voice problems and limitations that affect daily functioning),^{7,8} communicative participation takes environmental and contextual factors into account and may be relevant for a wider range of communication difficulties. Communicative participation has been examined in patients with a variety of specific disorders, such as multiple sclerosis,⁹ aphasia,¹⁰ facial paralysis,¹¹ spasmodic dysphonia,¹² and head and neck cancers.¹³

The purpose of the present study was to examine communicative participation and associated factors among a broad sample of patients with voice disorders, reflecting the typical population in a voice clinic. We specifically measured the associations between communicative participation and psychosocial distress, vocal impairment, and voice-specific perceived control.

Patients with voice disorders frequently have psychosocial distress (eg, symptoms of depression and anxiety) in addition to physical health concerns.¹⁴⁻¹⁹ Assessing psychosocial distress is important given its association with vocal impairment.²⁰ Although a negative association between communicative participation and depression has been observed in patients with head and neck cancers,²¹ the association between communicative participation and psychosocial distress has not been formally assessed in patients with voice disorders.

In addition to the association between communicative participation and psychosocial distress,²¹ communicative participation has a negative association with vocal impairment in patients with head and neck cancers^{22,23} and spasmodic dysphonia.¹² Further investigation is needed to assess the generalizability of these results to the broader range of individuals affected by voice concerns.

Perceived control is another important consideration for patients with voice disorders.²⁴⁻²⁹ Voice-specific perceived control, in particular, has been associated with better outcomes (eg, lower psychosocial distress and vocal impairment) among patients with voice disorders.^{24,26,30} Moreover, this voice-specific measure is associated with better outcomes to a greater extent than are general measures of control.²⁶ In a similar manner, problem-specific measures of self-efficacy (ie, the belief that actions result in desired outcomes) were associated with vocal impairment to a greater extent than were general self-efficacy measures among patients with spasmodic dysphonia.^{4,31,32} Although perceived control and self-efficacy are associated constructs, the former focuses specifically on perceived control over voice problems in the present (as opposed to the future or the past), whereas the latter refers more generally to having confidence that one's actions will result in desired outcomes. Communi-

Key Points

Question What are the associations between communicative participation and vocal impairment, psychosocial distress, and voice-specific perceived control in a broad sample of patients with voice disorders?

Findings In this cross-sectional study of 590 patients with voice disorders, communicative participation was associated with lower vocal impairment, lower psychosocial distress, and higher voice-specific perceived control. Moderation analyses indicated that communicative participation was negatively associated with psychosocial distress at all levels of perceived control.

Meaning The study's results suggest that communicative participation is an important consideration among patients with voice problems and that communicative participation can be easily and immediately assessed.

cative participation is also associated with perceived control, as patients who perceive that they have less control over their speech and interactions (eg, others' understanding of how to communicate with them) are less likely to engage in activities that require communicative participation.^{2,6,33-36}

Furthermore, perceived control has been found to moderate the association between vocal impairment and distress such that vocal impairment was associated with distress to a greater extent among patients with lower perceived present control.²⁰ Because communicative participation is associated with vocal impairment²² and perceived control moderates the association between vocal impairment and distress,²⁴ a logical question is whether perceived control also moderates the association between communicative participation and distress.

The primary objective of the present study was to examine the associations between communicative participation and vocal impairment, distress, and voice-specific perceived control. The secondary objective was to examine whether perceived control moderates the association of distress with communicative participation and vocal impairment, the latter of which would replicate previous research. We hypothesized that greater communicative participation is associated with lower vocal impairment and distress and greater voice-specific perceived control. Given the previously reported associations between vocal impairment and communicative participation and the moderating role of perceived control in the association between vocal impairment and distress,²⁰ we hypothesized that perceived control moderates the association of both communicative participation and vocal impairment with distress.

Methods

Participants

Consecutive new patients at an academic tertiary care voice clinic in Minnesota were invited to participate in the study. Recruitment and prospective enrollment in the cross-sectional survey study occurred from June 2014 to May 2017. This study followed the Strengthening the Reporting of Observational

Studies in Epidemiology (STROBE) reporting guideline. The study was reviewed and approved by the institutional review board of the University of Minnesota, and all participants provided written informed consent.

Patients independently completed the self-report measures on paper forms at a single time point before being examined by their health care practitioner. When available, validated short forms of measurement instruments were used to reduce participant burden. Self-reported sociodemographic information (eg, race and ethnicity) was collected to describe sample characteristics and assess the generalizability of data collected. Response options reflected items on the US Census or other similar standard question options at the time of study initiation; participants could select “other” and indicate their own sociodemographic category if needed.

Measures

Communicative participation was measured using the 10-item general short form³⁷ of the Communicative Participation Item Bank,^{12,37} which has high reliability and validity among patients with medical diagnoses that are associated with communication disorders. Patients rated the ways in which their condition interfered in specific situations (eg, “talking to people you know” and “communicating when you need to say something quickly”) on a 4-point scale ranging from 0 (very much) to 3 (not at all), with higher scores indicating a greater level of communicative participation. Summary scores were used for inferential tests to reflect the distribution of the study sample, and *t* scores (per the scoring guidelines for this measure) were used for descriptive analyses to facilitate comparison with other studies.

The 10-item version of the Voice Handicap Index^{7,8} was used to measure the physical, functional, and/or emotional impact of the voice problem for the patient, which is referenced as vocal impairment throughout this article based on evolving and potentially problematic implications of the term *handicap*. Patients rated items (eg, “My voice makes it difficult for people to hear me”) on a 5-point scale ranging from 0 (never) to 4 (always). Items were summed to create a total score.

The 18-item Brief Symptom Inventory^{38,39} was used to assess overall psychosocial distress (through the global severity index) and the subdomains of depression, anxiety, and somatic symptoms (through the relevant subscales). Patient-reported overall psychosocial distress was of primary interest, with the subdomains as secondary outcomes of interest. Patients were asked to report the extent to which a given problem distressed them (eg, for depression, “feeling no interest in things”; for anxiety, “nervousness or shakiness inside”; and for somatic symptoms, “faintness or dizziness”) on a 5-point scale ranging from 0 (not at all) to 4 (extremely). Mean scores were calculated for each subdomain and the global severity index.

Patient-reported voice-specific perceived control was the proposed moderating variable. Perceived control was measured with the 8-item present control subscale of the Perceived Control Over Stressful Events Scale,^{40,41} which was modified for patients with voice disorders.^{24,26,29} The adap-

tation assessed patients’ voice-specific perceived control rather than general stressors. Patients were asked to rate items (eg, “I have control over my day-to-day reactions to the voice problem”) on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Items were averaged, with reverse coding as appropriate.

Descriptive data, including medical characteristics, medical history, and voice diagnoses, were extracted from the patients’ medical records. General health was reported by the patient as either excellent, very good, good, fair, or poor. Meta-analyses have reported predictive validity for single-item self-report measures of general health status.^{42,43} Voice diagnoses were documented in the patients’ medical records by 1 of 2 laryngologists (one of whom was S.M.) at the clinic, as previously described elsewhere.¹⁷ If patients had multiple diagnostic categories in their records, then all provisional or definitive diagnoses were included.

Statistical Analysis

First, we calculated descriptive statistics (means and SDs) and examined the distributions (kurtosis and skewness) of measures. We then conducted bivariate Pearson correlation analyses among our variables of interest to address the main objective of measuring the associations between communicative participation and vocal impairment, psychosocial distress, and voice-specific perceived control. Pearson correlation coefficients were interpreted per psychological convention (ie, for small effect size, *r* is ≤ 0.10 to < 0.30 [R^2 is ≤ 0.02 to < 0.13]; for moderate effect size, *r* is 0.30 to < 0.50 [R^2 is 0.13 to < 0.26]; and for large effect size, *r* is ≥ 0.50 [R^2 is ≥ 0.26]).⁴⁴ We used Lee and Preacher⁴⁵ calculations to test the differences between Pearson correlations.

To address the secondary objective of examining whether perceived control moderated the association between communicative participation and psychosocial distress, we first examined sociodemographic variables that we would need to control for in our a priori model. To conduct this examination, we used hierarchical regression analyses, entering sociodemographic data (ie, race, sex, age, annual household income, and educational level) into step 1, general self-reported health status^{42,43} into step 2, 4 separate voice diagnosis categories (eg, benign, motion abnormalities, and neurologic disorders, assigned as previously described elsewhere¹⁷) into step 3, and communicative participation into step 4. Age was the only variable associated with distress in these models and was therefore retained as a covariate for the main models. We then standardized the predictor variables and conducted regression-based moderation analyses using the Hayes⁴⁶ PROCESS macro for SPSS software (SPSS Statistics) with the Johnson-Neyman technique⁴⁷ to probe the interactions of perceived control with both communicative participation and vocal impairment. Listwise deletion was used for missing values given our low percentage of missing data (2%) on the Communicative Participation Item Bank.

All data were analyzed using SPSS software, version 26 (IBM SPSS). Data analysis was performed from January to June 2020.

Table 1. Baseline Participant Characteristics

Characteristic	No./total No. (%)
Total participants, No.	590
Sex	
Female	390/590 (66.1)
Male	198/590 (33.6)
Age, mean (SD), y	51.9 (17.1)
Race/ethnicity	
White	550/590 (93.2)
Black/African American	18/590 (3.1)
Asian or Asian American	10/590 (1.7)
American Indian or Alaska Native	3/590 (0.5)
Native Hawaiian or Pacific Islander	1/590 (0.2)
Other	3/590 (0.5)
Hispanic, Latino/Latina, or Spanish origin	
No	536/546 (98.2)
Yes	10/546 (1.8)
Marital status	
Married	353/575 (61.4)
Widowed	23/575 (4.0)
Divorced or separated	76/575 (13.2)
Never married	123/575 (21.4)
Estimated annual household income, \$	
<30 000	105/503 (20.8)
30 000-50 000	77/503 (15.3)
51 000-80 000	92/503 (18.3)
81 000-150 000	168/503 (33.4)
>150 000	61/503 (12.1)
Educational level	
<High school	4/311 (1.3)
High school	32/311 (10.3)
Some college	83/311 (26.7)
Completed college	117/311 (37.6)
Graduate school	75/311 (24.1)
Employment status	
Unemployed	89/401 (22.2)
Employed	270/401 (67.3)
Retired	42/401 (10.5)
Diagnosis ^a	
Benign phonotraumatic/muscle tension dysphonia	426/590 (72.2)
Bowing/atrophy and/or motion abnormality (eg, unilateral vocal fold paralysis)	130/590 (22.0)
Neurologic disorder (eg, dystonia and Parkinson disease)	48/590 (8.1)
Other	212/590 (35.9)

^a Diagnoses do not total 100% because some patients had multiple concurrent diagnoses.

Results

Descriptive Analyses

Of the 744 consecutive patients with voice disorders who were approached, 590 patients (79.3%) chose to participate in the study. Most participants identified as female (390

women [66.1%]); 198 patients (33.6%) identified as male, with no patients identifying as transgender or other. Participants predominantly identified as White (550 of 590 patients [93.2%]) and/or non-Hispanic (536 of 546 patients [98.2%]). The mean (SD) age was 51.9 (17.1) years. Most participants were married (353 of 575 patients [61.4%]), with an estimated annual household income of \$81 000 to \$150 000 (168 of 503 patients [33.4%]). Many participants had completed college (117 of 311 patients [37.6%]) or graduate school (75 of 311 patients [24.1%]), and 270 of 401 participants (67.3%) were currently employed. Provisional or definitive diagnoses included benign and phonotraumatic voice disorders (426 of 590 patients [72.2%]), bowing and atrophy or motion abnormalities (130 of 590 patients [22.0%]), and laryngeal or systemic neurologic disorders (48 of 590 patients [8.1%]); 212 of 590 patients (35.9%) had other diagnoses (eg, infectious laryngitis, laryngeal web and/or stenosis, and possible cancer). Patients could have multiple concurrent diagnoses, so the total percentage of diagnoses exceeded 100%. Additional participant characteristics are presented in **Table 1**.

The internal consistency of scores on each measure was calculated with Cronbach α . The Cronbach α was 0.97 for communicative participation (measured by the Communicative Participation Item Bank); 0.92 for vocal impairment (measured by the Voice Handicap Index); 0.91 for overall psychosocial distress, 0.89 for depression, 0.85 for anxiety, 0.75 for the somatic symptom subscales (measured by the Brief Symptom Inventory); and 0.80 for voice-specific perceived control (measured by the present control subscale of the Perceived Control Over Stressful Events Scale).

Descriptive statistics (mean, SD, skewness, and kurtosis) of primary and secondary outcomes are listed in **Table 2**. All variables met the criteria for normality based on guidelines for samples larger than 300,⁴⁸ suggesting normality when skewness was less than 2 and kurtosis was less than an absolute value of 7.

Primary and Secondary Outcomes

All primary and secondary outcome variables were correlated with each other at $\alpha = .01$ in the hypothesized directions (**Table 2**). Communicative participation had a negative association with vocal impairment ($r = -0.73$; 95% CI, -0.77 to -0.69), a positive association with perceived control ($r = 0.30$; 95% CI, 0.23 - 0.37), and negative associations with overall psychosocial distress ($r = -0.22$; 95% CI, -0.30 to -0.14), anxiety ($r = -0.16$; 95% CI, -0.24 to -0.08), depression ($r = -0.17$; 95% CI, -0.25 to -0.09), and somatic symptoms ($r = -0.24$; 95% CI, -0.31 to -0.16). Only the somatic symptoms subscale differed in its association with communicative participation compared with vocal impairment ($r = -0.13$; 95% CI, -0.21 to -0.05), with greater bivariate association between somatic symptoms and communicative participation ($z = 1.91$).

Perceived control did not moderate the association between communicative participation and overall psychosocial distress ($B = 0.02$; 95% CI, -0.02 to 0.07 ; $R^2 = 0.002$) (**Table 3**). Communicative participation was negatively associated with

Table 2. Descriptive Statistics and Bivariate Pearson Correlations of Primary and Secondary Outcomes^a

Outcome	Pearson <i>r</i>						
	CPIB-10	VHI-10	PCOSES present control	BSI-18 global	BSI-18 anxiety	BSI-18 depression	BSI-18 somatic symptoms
Communicative participation (CPIB-10)	1.00	-0.73 (-0.77 to -0.69) ^b	0.30 (0.23 to 0.37) ^c	-0.22 (-0.30 to -0.14) ^d	-0.16 (-0.24 to -0.08) ^e	-0.17 (-0.25 to -0.09) ^e	-0.24 (-0.31 to -0.16) ^e
Vocal impairment (VHI-10)	-0.73 (-0.77 to -0.69)	1.00	-0.31 (-0.38 to -0.24) ^b	0.17 (0.09 to 0.25) ^f	0.15 (0.07 to 0.23) ^g	0.16 (0.08 to 0.24) ^g	0.13 (0.05 to 0.21) ^f
Voice-specific perceived control (PCOSES present control)	0.30 (0.23 to 0.37)	-0.31 (-0.38 to -0.24)	1.00	-0.32 (-0.39 to -0.25) ^h	-0.29 (-0.36 to -0.22) ⁱ	-0.32 (-0.39 to -0.25) ⁱ	-0.19 (-0.27 to -0.11) ⁱ
Overall psychosocial distress (BSI-18 global)	-0.22 (-0.30 to -0.14)	0.17 (0.09 to 0.25)	-0.32 (-0.39 to -0.25)	1.00	0.89 (0.87 to 0.91) ^j	0.87 (0.87 to 0.91) ^j	0.78 (0.75 to 0.81) ^j
Anxiety (BSI-18 anxiety subdomain)	-0.16 (-0.24 to -0.08)	0.15 (0.07 to 0.23)	-0.29 (-0.36 to -0.22)	0.89 (0.87 to 0.91)	1.00	0.75 (0.71 to 0.78) ^k	0.52 (0.46 to 0.58) ^k
Depression (BSI-18 depression subdomain)	-0.17 (-0.25 to -0.09)	0.16 (0.08 to 0.24)	-0.32 (-0.39 to -0.25)	0.87 (0.87 to 0.91)	0.75 (0.71 to 0.78)	1.00	0.45 (0.38 to 0.51) ^k
Somatic symptoms (BSI-18 somatic symptom subdomain)	-0.24 (-0.31 to -0.16)	0.13 (0.05 to 0.21)	-0.19 (-0.27 to -0.11)	0.78 (0.75 to 0.81)	0.52 (0.46 to 0.58)	0.45 (0.38 to 0.51)	1.00
Mean (SD) score	16.51 (9.05) ^l	19.10 (9.55)	2.88 (0.59)	0.59 (0.57)	0.62 (0.66)	0.51 (0.69)	0.63 (0.68)
Skewness	-0.14	0.15	-0.03	1.79	1.76	1.96	1.45
Kurtosis	-0.54	-0.65	-0.51	3.96	3.59	4.20	2.18

Abbreviations: BSI-18, Brief Symptom Inventory, 18-item version; CPIB-10, Communicative Participation Item Bank, 10-item general short form; PCOSES, Perceived Control Over Stressful Events Scale, 8-item present control subscale; VHI-10, Voice Handicap Index, 10-item version.

^a Values are the same as their matching paired set across the diagonal of table cells; cells with a value of 1.00 indicate points at which each variable is perfectly correlated with itself.

^b n = 532.

^c n = 565.

^d n = 570.

^e n = 569.

^f n = 534.

^g n = 533.

^h n = 568.

ⁱ n = 567.

^j n = 572.

^k n = 571.

^l Median score, 50.30 (range, 24.20-71.00); mean (SD) of *t* score, 49.06 (12.65).

Table 3. Analysis of Perceived Control as a Moderator of the Association Between Communicative Participation and Overall Psychosocial Distress^a

Variable	B (SE)	95% CI	t
Intercept	0.82 (0.07)	0.68 to 0.96	11.37
Participant age	-0.01 (0.001)	-0.01 to -0.002	-3.52
Communicative participation ^b	-0.09 (0.02)	-0.04 to -0.13	-3.60
Perceived control ^c	-0.16 (0.02)	-0.20 to -0.11	-6.60
Interaction between communicative participation and perceived control	0.02 (0.02)	-0.02 to 0.07	1.02

^a A total of 565 patients were included in the analysis. The difference in *R*² was 0.002 for the step with the interaction term. Covariate and predictor variables were standardized before analysis.

^b Measured by the Communicative Participation Item Bank, 10-item general

short form.

^c Measured by the voice-specific Perceived Control Over Stressful Events Scale, 8-item present control subscale.

overall psychosocial distress (*B* = -0.09; 95% CI, -0.04 to -0.13) across all levels of perceived control. A similar pattern was observed for the distress subscales (depression, anxiety, and somatic symptoms). Perceived control did moderate the association between vocal impairment and overall psychosocial distress (*B* = -0.05; 95% CI, -0.10 to -0.01; *R*² = 0.01) (Table 4). In follow-up analyses using the Johnson-Neyman technique, vocal impairment was positively associated with distress in 255 of 529 patients (48.2%) with the lowest per-

ceived control scores. This transition point corresponded with a score of 2.86 on the perceived control measure (0.03 SD below the mean). Vocal impairment was not associated with distress among patients with perceived control scores higher than that cutoff point. The results were similar for the distress subscales with the exception of somatic symptoms, in which the association between vocal impairment and somatic symptoms was not conditional on any value of perceived control.

Table 4. Analysis of Perceived Control as a Moderator of the Association Between Vocal Impairment and Overall Psychosocial Distress^a

Variable	B (SE)	95% CI	t
Intercept	0.78 (0.08)	0.64 to 0.93	10.49
Participant age	-0.004 (0.001)	-0.01 to -0.002	-3.05
Vocal impairment ^b	0.05 (0.02)	-0.001 to 0.09	1.91
Perceived control ^c	-0.17 (0.03)	-0.21 to -0.12	-6.77
Interaction between vocal impairment and perceived control	-0.05 (0.02)	-0.10 to -0.01	-2.22

^a A total of 565 patients were included in the analysis. The difference in R^2 was 0.01 for the step with the interaction term. Covariate and predictor variables were standardized before analysis.

^b Measured by the Voice Handicap Index, 10-item version.

^c Measured by the voice-specific Perceived Control Over Stressful Events Scale, 8-item present control subscale.

Discussion

Communicative participation may be broadly conceptualized as engaging with other individuals in situations that necessitate the verbal exchange of knowledge or information. To our knowledge, this study is the first to examine communicative participation in a broad sample of patients with voice disorders. Studying patients with a variety of voice disorders informs the usefulness of assessing communicative participation in routine clinical practice. Communicative participation was associated with all other study variables in the hypothesized directions and had an association with somatic distress that was greater than the association between somatic distress and vocal impairment; however, this pattern was not observed in the depression or anxiety subscales. Communicative participation was associated with distress across all levels of perceived control, indicating that perceived control did not moderate this association. That is, the association between communicative participation and distress was similar regardless of patient level of perceived control. In contrast, perceived control did moderate the association between vocal impairment and psychosocial distress, replicating the results of a previous study.²⁴ In this case, patient level of perceived control did change the extent of the association between vocal impairment and distress; specifically, the association between vocal impairment and distress was greater among patients with lower perceived control than among those with higher perceived control.

These results build on current findings in the literature and present additional data indicating an association between communicative participation and psychosocial distress (depression, anxiety, and somatic symptoms) among patients with a wide range of voice disorders. Our results are consistent with previous studies that reported associations between vocal impairment and psychological distress,²⁰ vocal impairment and communicative participation,^{12,22,23} and communicative participation and depression.²¹ The association with depression was smaller among the voice clinic patient population of the present study than has been observed among patients with head and neck cancers,²¹ perhaps reflecting greater psychosocial distress in patients with head and neck cancers and/or differences based on measurement scales. To our knowledge, there is no previous literature examining the associa-

tion of anxiety and somatic concerns with communicative participation. Given the nascent yet expanding body of literature on perceived control and voice disorders,²⁴⁻²⁹ the present study also provides new knowledge regarding the association of perceived control with another aspect of the experience of people with voice disorders: communicative participation. Our findings replicated those of a previous study that indicated a moderating role of perceived control in the association between vocal impairment and psychosocial distress, which is valuable because replication studies are relatively uncommon and often unsuccessful.⁴⁹ Although the observed moderating role was small, both of these studies suggest that the association between vocal impairment and distress differs in extent based on the patient's level of perceived control.

Clinical Implications

The results of the present study have implications for clinical practice owing to the inclusion of a spectrum of patients with voice concerns, supporting the potential utility of communicative participation measures across the variety of patients who present with voice concerns in clinical practice. Concurrent assessment of psychosocial factors (eg, communicative participation, perceived control, and psychosocial distress) in addition to voice-specific symptoms provides valuable context for patient care. Vocal impairment was positively associated with communicative participation, and each had similar associations with different subdomains of psychosocial distress. One difference is that patients with higher levels of communicative participation reported lower distress regardless of their perceived level of control over their voice problems. However, higher levels of perceived control reduced the extent of the association between vocal impairment and distress. Thus, vocal impairment and communicative participation cannot be considered interchangeable either on a theoretical or empirical basis. Current clinical and research practices focus mainly on decreasing vocal impairment, and these findings support the value of explicitly integrating communicative participation as a primary or secondary target.

Given the observation that psychosocial distress was associated with communicative participation, voice-specific perceived control, and, to a lesser extent, vocal impairment, all of these factors could be considered when aiming to reduce patients' distress. Perceived control and communicative participation both involve malleable thoughts and behaviors and

suggest potential targets for intervention in research and clinical care for patients with voice disorders. For example, a pilot study of a voice-specific perceived control intervention suggested that increases in perceived control may be associated with reductions in vocal impairment.²⁹ In addition, the contextual focus of communicative participation may help to identify problematic contexts and situations, allowing for more targeted intervention, potentially with the aim of maximizing the level of perceived control associated with those specific challenges. These approaches could complement or enhance standard voice treatments.

Limitations

Although this study had a large sample and included consecutive patients at a voice clinic, the data were cross-sectional, precluding causal inferences regarding the associations between communicative participation, vocal impairment, perceived control, and psychosocial distress. The selection of variables as predictor, outcome, or moderator required careful consideration. We examined psychosocial distress as an outcome variable given the transdiagnostic recognition of distress among patients across multiple otolaryngologic areas.¹⁴⁻¹⁹ In addition, although the study included a variety of voice diagnoses and all patients were new to the academic tertiary care voice clinic, there may have been variable degrees of previous knowl-

edge about their voice problems and previous treatments that may have affected their responses on the voice-specific scales. Racial and ethnic diversity in the sample was limited, in part reflecting the demographic characteristics of the state, which limits the generalizability of the study's results to other populations.

Conclusions

In this study, communicative participation was associated with, but distinct from, vocal impairment. Communicative participation was associated with both voice-specific perceived control and lower psychosocial distress. Psychosocial factors, such as communicative participation and perceived control, are important to consider in voice research and clinical care, as both factors are associated with physical and mental well-being (eg, vocal impairment and psychosocial distress). Future research on communicative participation could use longitudinal methods and consider experimental approaches focused on targeting specific factors. The study's findings suggest that clinicians may consider including communicative participation alongside vocal impairment, perceived control, and psychosocial distress when assessing patients with voice disorders.

ARTICLE INFORMATION

Accepted for Publication: November 2, 2020.

Published Online: December 23, 2020.
doi:10.1001/jamaoto.2020.4956

Correction: This article was corrected on March 18, 2021, to fix negative signs in Table 2 and Table 3.

Author Contributions: Drs Nguyen-Feng and Misono had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Frazier, Misono.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Nguyen-Feng, Asplund, Misono.

Critical revision of the manuscript for important intellectual content: Nguyen-Feng, Frazier, Misono.

Statistical analysis: Nguyen-Feng.

Obtained funding: Misono.

Administrative, technical, or material support: Asplund, Misono.

Supervision: Frazier, Misono.

Conflict of Interest Disclosures: Dr Misono reported receiving grants from the National Institutes of Health and the American College of Surgeons during the conduct of the study. No other disclosures were reported.

Funding/Support: This study was supported by grants K23DC016335, UL1TR000114, and KL2RR0333182 from the National Institutes of Health and grants from the American College of Surgeons.

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or

approval of the manuscript; and decision to submit the manuscript for publication.

Disclaimer: The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the American College of Surgeons.

Additional Contributions: Brenna Finley, MPH, Meg Her, MPH, and Ali Stockness, MPH, were research coordinators, and Deirdre D. Michael, PhD, CCC-SLP, Lisa Butcher, MS, CCC-SLP, and George S. Goding Jr, MD, were clinical collaborators for this study. At the time of the study, all contributors were affiliated with the Department of Otolaryngology-Head and Neck Surgery, University of Minnesota, Twin Cities. Research coordinators were compensated for their time as members of the research team, and clinical collaborators were not specifically compensated for involvement with the study.

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