HHS Public Access

Author manuscript

Health Psychol. Author manuscript; available in PMC 2018 November 14.

Published in final edited form as:

Health Psychol. 2017 November ; 36(11): 1105–1108. doi:10.1037/hea0000520.

Brief Report: Perceived Control and Voice Handicap in Patients with Voice Disorders

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Abstract

Objective: The purpose of the study was to replicate and extend previous research on the relation between perceived present control and voice handicap and to further examine the psychometric properties of a present control scale adapted for patients with voice disorders (Misono, Meredith, Peterson, & Frazier, 2015).

Methods: Sample 1 consisted of 1,129 patients recruited from a voice disorder clinic who completed measures of perceived present control, distress, and voice handicap in the clinic. Sample 2 consisted of 62 patients from the same clinic who completed measures of present control, distress, voice handicap, and general control beliefs online at baseline and measures of present control and voice handicap again 3 weeks later (n = 59).

Results: With regard to the psychometric properties of the voice-adapted present control scale, alpha coefficients were above .80 and the 3 week test-reliability coefficient was .69. There was mixed support for the hypothesized one-factor structure of the scale. In Sample 1, present control was more strongly associated with lower voice handicap than was distress, and accounted for significant variance in voice handicap controlling for distress. In Sample 2, present control at baseline predicted later voice handicap, controlling for general control beliefs and distress.

Conclusions: Present control appears to be a promising target for adjunctive interventions for patients with voice disorders. An evidence-based online present control intervention (Hintz, Frazier & Meredith, 2015) is being adapted for this patient population.

Keywords

dysphonia; perceived control; distress

Many studies have found that perceived control is related to better physical and mental health, including lower mortality risk (e.g., Turiano, Chapman, Agrigoroaei, Infurna &

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Lachman, 2014). These studies often assess individuals' perceptions that they generally have control over events in their lives. Because control has many different aspects (Skinner, 1996), general measures may not fully capture the relations between control perceptions and health outcomes. For example, some studies have shown that event-specific measures of control are more strongly related to outcomes than are general control measures: In one study of patients with breast cancer, control over life in general was unrelated to outcomes controlling for event-specific aspects of control, such as control over physical symptoms (Beckjord, Glinder, Langrock, & Compas, 2009). Other studies have shown that not all aspects of control are associated with better outcomes. For example, in another study of patients with cancer, when various aspects of control were examined together, including general control beliefs, only control over cancer onset was associated with depression, with more control over onset associated with *higher* depression levels (Newsom, Knapp, & Schulz, 1996).

The Perceived Control over Stressful Events Scale (PCOSES; Frazier et al., 2011; Frazier et al., 2012) was developed to assess event-specific control perceptions and to distinguish among aspects of control that are more or less adaptive. Specifically, past control (e.g., control over illness onset) tends to be associated with poorer outcomes whereas aspects of control that focus on the present (e.g., control over current symptoms) are associated with better outcomes (Frazier, Berman, & Steward, 2001). Whether future-oriented control beliefs are adaptive depends partly on the objective controllability of the event (Frazier & Caston, 2015). Scores on this measure have shown evidence of internal consistency and test–retest reliability as well as convergent, discriminant, and incremental validity in college students. Importantly, present control (i.e., control over current aspects of stressors) was the only form of control consistently related to better mental and physical health, and predicted outcomes beyond general control beliefs, coping strategies, social support, neuroticism, and prior life stressors (Frazier et al., 2011; Frazier et al., 2012). An online intervention designed to increase present control has been shown to reduce depression, anxiety, and stress in college students in several clinical trials and increased present control was the mechanism of change (e.g., Hintz, Frazier, & Meredith, 2015).

The PCOSES was developed to enable comparison of the relations between perceived control and outcomes across events (versus measures that only apply to specific events, such as cancer). However, the PCOSES also can be adapted for use by individuals with specific medical (or other) conditions. For example, the PCOSES has been adapted for use by patients with voice disorders (Misono, Meredith, Peterson, & Frazier, 2015). This is an important condition to study because voice disorders have a lifetime prevalence of approximately 30% (Cohen, 2010) and a quality of life impact similar to chronic health problems such as congestive heart failure (Cohen, Dupont, & Courey, 2006). Voice disorders also lead to an estimated $2 billion annual loss in work productivity (Schwartz et al., 2009). Very few studies have examined the role of psychosocial factors, such as perceived control, in the development or maintenance of voice problems. In the only study of which we are aware that has examined perceived control among patients with voice disorders, present control (measured by the PCOSES adapted for voice patients) was more strongly related to self-reported voice handicap ($r = -.30$) than were psychological distress ($r = .13$) or

perceived stress (r = .16) (Misono et al., 2015). Thus, present control may be a useful target for intervention among patients with voice disorders.

Prior to adapting our online present control intervention for patients with voice disorders, we aimed to replicate and extend our findings regarding the relation between present control and voice handicap, which is considered a key outcome measure for patients with voice disorders (Behlau, Madazio, & Oliveira, 2015). In Sample 1 (the largest prospective sample of patients with voice disorder to date), we predicted that present control would be more strongly associated with (lower) voice handicap than would distress, and would account for significant variance in voice handicap controlling for distress. In Sample 2 (a smaller longitudinal sample), we extended these findings by using a different distress measure, collecting short-term longitudinal data, and assessing general control beliefs as well as event-specific control. We hypothesized that present control would predict subsequent voice handicap, controlling for general control beliefs and distress. A secondary aim was to further examine the psychometric properties of the voice-adapted present control scale (which has only been used in one previous study). In Sample 1, we assessed the fit of a one-factor structure using exploratory and confirmatory factor analysis. In Sample 2, we assessed 3-week test-reliability. Internal consistency was assessed in both samples.

Methods

Participants and Procedures

Consecutive adult patients presenting with voice concerns at an academic otolaryngology clinic were invited to participate by research staff. Patients were included regardless of specific voice-related diagnoses to increase sample heterogeneity and generalizability. Sample 1 consisted of prospectively enrolled patients at the voice clinic from April 2012 through May 2016 (N = 1,129) who completed consent forms and measures in the clinic. The first 192 and 533 patients of this sample were included in earlier papers (Misono et al., 2014; Misono et al., 2015). Sample 2 (N = 62) was recruited through the voice clinic for a short-term longitudinal study in August and September 2016. Participants completed consent forms and all measures online at Time 1 (N = 62) and measures of present control and voice handicap control again 3 weeks later at Time 2 (N = 59). Both Samples 1 and 2 were predominantly female (62%, 73%) and white (93%, 100%), with annual household incomes of at least $50,000 (60%, 71%). The most common voice-related diagnoses were muscle tension dysphonia, benign vocal fold mass, and irritable larynx. Demographic and medical information was abstracted from medical records. The study was approved by the University of Minnesota institutional review board.

Measures

The references provided in this section contain information on the reliability and validity of scores on the measures. To save space, the details are not included here.

Perceived present control.—Perceived control was assessed using the eight-item Present Control Subscale of the Perceived Control over Stressful Events Scale (PCOSES; Frazier et al., 2011; Frazier et al., 2012) modified for voice patients (Misono et al., 2015).

Patients rated items (e.g.., “I have control over my day-to-day reactions to the voice problem”, “How I deal with the voice problem now is under my control”, “There isn’t much I can do to help myself feel better about this problem”) on a 1 (*Strongly disagree*) to 4 (*Strongly agree*) scale.

Voice handicap.—Voice handicap was assessed using the Voice Handicap Index-10 (VHI-10; Rosen, Lee, Osborne, Zullo, & Murray, 2004), a ten-item scale that assesses voice-related physical, emotional, and functional concerns. Patients indicated the frequency with which statements (e.g., “I feel as though I have to strain to produce voice”, “My voice problem upsets me”, “My voice makes it difficult for people to hear me”) were applicable to their life on a 0 (*Never*) to 4 (*Always*) scale. The alpha coefficients were .93 for Sample 1 and .87 (Time 1) and .88 (Time 2) for Sample 2.

Psychological distress.—In Sample 1, distress was assessed using the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000), which assesses depression, anxiety, and somatic symptoms. Items were rated on a 0 (*not at all*) to 4 (*extremely*) scale. BSI-18 total scores were used in the analyses (α = .89). In Sample 2, distress was assessed using the short-form Anxiety (7 items) and Depression (8 item) scales from the Patient-Reported Outcomes Measurement Information System (PROMIS; Pilkonis et al., 2011). Patients rated items on a 0 (*Never*) to 4 (*Always*) scale. Alpha coefficients were .92 for both PROMIS measures. Items on all distress measures were answered with regard to the past week.

General control beliefs (Sample 2 only).—The 7-item Pearlin Mastery Scale (Pearlin & Schooler, 1978) was used to assess general control beliefs. Items were rated on a 0 (*Never*) to 4 (*Always*) scale (α =.84).

Results and Discussion

Psychometric Properties

Factor structure.—An exploratory factor analysis (EFA) was performed in one random half of Sample (N = 556), followed by a confirmatory factor analysis (CFA) in the other half (N = 573). The EFA used maximum likelihood estimation with a promax rotation. Two factors were extracted, with eigenvalues of 3.51 and 1.11. The small second factor consisted of the four reverse-coded items. When one factor was specified, all items loaded above .44 on that factor. In the CFA, which also used maximum likelihood estimation, the two-factor model fit better (Comparative Fit Index [CFI] = .94, Root Mean Square Error of Approximation [RMSEA] = .08, Standardized Root Mean Square Residual [SRMR] = .04) than the one-factor model (CFI = .82, RMSEA = . 13, SRMR = .07). However, again, only the four reverse-coded items loaded on the second factor. When a one-factor model was specified, all items loaded above .44 on that factor.

This was the first factor analysis of the voice-adapted present control scale. Although the two-factor solution fit better than the hypothesized one-factor solution in the CFA, we decided not to split the present control scale into two subscales because (a) the second factor reflected a methodological artifact rather than a conceptually meaningful factor, (b) all items loaded above .44 on one factor in both halves of the data, (c) splitting the scale into two

subscales reduced the alpha coefficients, (d) when two subscales were created, they had similar correlations with other variables, and (e) previous factor analyses of the full PCOSES have found three factors (past, present, future control) and no evidence of a second present control factor (Frazier et al., 2011).

Reliability.—Alpha coefficients were .80 in Sample 1 and .84 (Time 1) and .81 (Time 2) in Sample 2. These values were similar to findings from an earlier study of 533 patients from the same clinic (α = .79; Misono et al., 2015) as well as alpha coefficients for the standard version of the present control subscale (α s = .77 to .86; Frazier et al., 2011; Frazier et al., 2012). The 3-week test-retest reliability in Sample 2 was r = .69, which was somewhat higher than coefficients for the standard version of the present control subscale in college student samples (rs = .48 to .59; Frazier et al., 2011; Frazier et al., 2012).

Present Control and Voice Handicap

In both samples, present control was associated with reporting less voice handicap, with medium to large correlations (rs = −.31 to −.52; see Table 1). Present control was more strongly related to voice handicap than was distress, which had small relations with voice handicap (rs = .11 to .16). Tests of the significance of the differences in these correlations were all significant, all ps <.001. Although voice handicap was our primary outcome, present control also was associated with reporting less concurrent distress in both samples (rs = −.37 to −.56).

In Sample 1, a hierarchical regression was performed in which voice handicap was regressed on BSI-18 total scores in Step 1,F (1, 1033) = 21.95, p<.0001, R^2 change = .02, and present control in Step 2, F(1, 1032) = 84.44, p<.0001, R^2 change = .07. As predicted, present control predicted voice handicap, controlling for general distress. In the second step, only present control predicted distress (β = −.29, p<.001).

In Sample 2, T2 voice handicap was regressed on T1 depression, anxiety, and general control beliefs in Step 1, F (3, 50) = 0.81, p = .49, R^2 change = .05, and T1 present control in Step 2, F (1, 49) = 9.45, p < .01, R^2 change = .15. Present control predicted subsequent voice handicap, controlling for distress and general control beliefs, and was the only significant predictor in the final step (β = −.54, p<.001).

These findings are consistent with prior research showing that present control is negatively related to voice handicap, and that this relation is stronger than the relation between distress and voice handicap (Misono et al., 2015). Past research using the VHI-10 also has found weak relations between voice handicap and distress (r = .13; Misono et al., 2015) although relations between the 30-item version of the VHI (which includes more emotion items) and distress are slightly higher (rs = .17-.23; Siupsinskiene, Razbadauskas, & Dubosas, 2011). The event-specific measure of present control was related to voice handicap controlling for general control beliefs, consistent with prior research with patients with cancer (e.g., Beckjord et al., 2009) and research with the PCOSES in college students (Frazier et al., 2011). Although the data reported here were correlational, other research indicates that increasing present control through online interventions is causally related to reduced distress (e.g., Hintz et al., 2015). Present control may also be easier to change in an adjunctive

intervention with patients with voice disorders than distress (e.g., depression) or general beliefs about control, and was acknowledged as an important factor to consider for improving outcomes for patients with voice disorders (Behlau et al., 2015).

Based on the efficacy of our intervention with college students, and the robust relations between present control and voice handicap, we currently are adapting our online present control intervention for patients with voice disorders. Online interventions are particularly promising for this patient group because they do not involve vocal burden and are easy to disseminate. If successful, this approach could also be used with patients with other medical conditions.

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Table 1

Correlations among Study Measures in Samples 1 and 2

Sample 1							
	Present Control	Distress	VHI				
Distress	−.37***						
VHI	−.31***	.14***					
M (SD)	2.92 (.60)	.59 (.59)	19.25 (9.64)				
Sample 2							
	T1 Present Control	T2 Present Control	T1 VHI	T2 VHI	T1 Anxiety	T1 Depression	T1 Mastery
T2 Present Control	.69***						
T1 VHI	−.35**	−.27*					
T2 VHI	−.40**	−.52***	.87***				
T1 Anxiety	−.56***	−.42***	0.16	0.14			
T1 Depression	−.56***	−.36**	0.11	0.06	.67***		
T1 Mastery	.62***	57***	−.30*	−.26*	−.53***	−.54***	
M (SD)	3.12 (.53)	3.15 (.54)	17.02 (6.56)	17.27 (7.09)	16.34 (5.48)	14.84 (5.42)	21.34 (3.91)

Note. Sample 1 *N* = 1,129. Sample 2 *N*'s = 62 at Tl; 59 at T2. T1 = Time 1; T2 = Time 2. M = mean. SD = standard deviation.

* p<.05

** p<0.01

*** p<.001