The correlation of phrases and feelings with disability

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Abstract

Background Patient expressions reflect disability and psychological factors. The aim of this study was to list common phrases and feelings in hand surgery practice and to prospectively study the correlation of these phrases and to correlate them with possible associated feelings and disability.

Methods Eighty-three patients completed the short version of the disabilities of arm, shoulder and hand (QuickDASH) questionnaire to measure disability, the pain self-efficacy questionnaire (PSEQ) to study coping, and a pain scale. The patients also completed the phrases and feelings questionnaire, which list verbal expressions patients often use. Pearson's correlation was used to test the correlation of continuous variables, and independent *t* test and one-way ANOVA were used for

categorical variables. All variables with $p < 0.08$ were inserted in a multivariable regression.

Results There was a large correlation between the individual phrases and feelings questions with PSEQ and QuickDASH. The best model for the combined phrases questionnaire included pain, PSEQ, smoking, and other pain conditions. The best model for the combination of all the feelings questions included PSEQ, pain, and marital status. The best model for QuickDASH included phrases, PSEQ, prior treatment, and working status, with phrases being the strongest factor.

Conclusions Patients use specific phrases that indicate the magnitude of their disability and the effectiveness of their coping strategies. Providers should respond to these phrases by empathetically acknowledging these aspects of the human illness experience.

Level of evidence: diagnostic level II

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Keywords Patient language · Disability · Pain · Self-efficacy

Introduction

It is important to pay attention to the patient's language and verbal expressions in a medical encounter [18]. Patients can give verbal cues to their health-care provider, such as mentioning anxiety or depression, and these cues can be an indicator of emotional discomfort [18]. Patients with greater psychological distress as measured with the general health questionnaire (GHQ) provide more cues [4, 5, 18].

Patient language is correlated with disability in patients with low back pain and can give health-care providers an indication for the need of emotional support [3, 5, 13, 14]. There is room for improvement; physicians do not respond adequately to all cues [7, 9, 18].

In patients with hand and upper extremity illness, pain and psychological factors are significant mediators of disability [6, 10, 12, 15–17]. A recent study investigated whether disability

and psychological factors were influenced by specific patient expressions [2]. Patient verbal expressions (phrases) were listed from a transcript and were categorized; specific phrases categories were correlated with pain, disability, and catastrophic thinking [2].

This study builds on the findings of the previous study, by listing the most common and influential patient expressions into a phrases and feelings questionnaire, which are new.

The purpose of this study was (1) to assess how often patients use phrases and feelings, (2) to examine the correlation of the individual questions in the phrases and feelings questionnaire, (3) to evaluate the validity and internal consistency of the phrases and feelings questionnaire, and (4) to find predictors of disability and the phrases and feelings questionnaire.

Materials and Methods

Study Design

This prospective IRB-approved cross-sectional cohort study was done in a tertiary orthopedic hand and upper extremity practice that also serves a broad primary care network. We invited English-speaking, nonpregnant, adult patients, visiting our hand clinic with a nontraumatic complaint to participate in the study. Ninety-four patients were asked to enroll in this study between March and June 2012. Ten patients declined to participate, and one patient turned out to have a traumatic injury and was excluded, which left 83 patients in the study. All patients were enrolled by a researcher not involved in the patients' care, and all patients provided informed consent.

The cohort consisted of 54 females (65 %) and 29 males (35 %), with a mean age of 48 ± 16 years (range, 18 to 81 years). Thirty-one percent of the patients also had other pain conditions, and the median duration of symptoms was 9 months. Most patients were married (48 %), and 49 % worked full time (Table 1). There were a variety of diagnoses (Table 2).

Evaluation

Patients completed the QuickDASH, which is the short version of the disabilities of arm, shoulder and hand (DASH) questionnaire and consists of 11 questions of the original 30 questions [1, 8]. Higher scores indicate higher arm-specific disability [1, 8]. Two patients had more than one missing question and, therefore, an invalid QuickDASH [1, 8]. We imputed the mean score of the group for these missing scores.

The pain self-efficacy questionnaire (PSEQ) was administered to measure the confidence a patient has in doing things despite the pain [11]. The PSEQ is a 10-item questionnaire, scored on a seven-point Likert scale ranging from 0 (not at all confident) to 6 (completely confident), and a higher score

Table 1 Patient demographics

Parameter	<i>n</i> = 83			Number	Percent
	Mean	SD	Range		
Age (years)	48	16	18–81		
Patient's self-rating of health	7.9	1.8	1–10		
Education (years)	15	3.2	5–23		
Sex					
Male				54	65
Female				29	35
Other pain conditions					
Yes				26	31
No				57	69
Treatment before					
Yes				34	41
No				49	59
Prior surgery					
Yes				9	11
No				74	89
Smoking					
Yes				16	19
No				67	81
Marital status					
Single				28	34
Living with partner				7	8.4
Married				40	48
Separated/divorced				3	3.6
Widowed				5	6.0
Working status					
Full time				41	49
Part time				14	17
Homemaker				3	3.6
Retired				11	13
Unemployed, able to work				6	7.2
Unemployed, unable to work				7	8.4
Workers compensation				1	1.2

indicates a better confidence of the patient in doing things despite the pain [11].

Pain intensity was measured with an 11-point ordinal scale, where 0 was no pain, and 10, the worst pain the patients ever had.

To measure how often patients might say specific things about their condition, we created a nine-question phrases questionnaire. Answers were given on a five-point Likert scale, where 1 was never, and 5, frequent. The questions were the following: (1) "I'm dropping things," (2) "I'm feeling weak," (3) "My hand gets numb," (4) "I have excruciating pain," (5) "I have a high threshold for pain," (6) "The pain is unbearable," (7) "I can't even do simple things," (8) "It's moving along my arm," and (9) "There's swelling." The sum of the questions was added, so a total score between 9 and 45 was possible. There

Table 2 Diagnoses

Diagnoses	<i>n</i> =83 Number	Percent
Nonspecific arm pain	19	23
Osteoarthritis	14	17
Ganglion/benign tumor	12	15
Carpal tunnel syndrome	11	13
Trigger finger	5	6.0
Dupuytren's disease	5	6.0
Lateral and medial epicondylitis	5	6.0
Ulnar nerve/cervical neuropathy	4	4.8
De Quervain's disease	4	4.8
More than 1 diagnosis	4	4.8

were three missing questions in three patients, and we imputed the mean of the patient's other questions for these missing answers.

To measure the feelings patients have about their condition, we designed a five-question feelings questionnaire. The rate of agreement with the feelings was answered on a five-point Likert scale (1, strongly disagree; 5, strongly agree): (a) "I don't trust my arm," (b) "I can't depend on my arm," (c) "It feels like something serious," (d) "If we don't do something, it will only get worse," and (e) "When I feel pain, I'm causing more damage". The answers to the questions were summed up, and total scores ranged between 5 and 25 points.

The phrases questionnaire is a list of verbal expressions patients use during encounters with health providers. The feelings questionnaire is a list of feelings that might correspond with the various phrases. We calculated the Cronbach's alpha coefficient as an indication of internal consistency and the intraclass correlation coefficient for reliability of the phrases and feelings. We also listed floor (the percentage of patients with the lowest score) and ceiling effects (patients with the maximum score).

Statistical Evaluation

An a priori power analysis for our primary study question determined that 84 patients would be needed to provide 80 % power to detect a 0.30 (medium) correlation between the continuous scores of phrases and feelings with alpha of 0.05.

The Shapiro–Wilk test was used to test for normality. The questionnaires were normally distributed, and therefore, we decided to use parametric tests. The correlation between the individual questions of the phrases and feelings questionnaires were tested with Pearson's correlation. This test was also used to assess the correlations between the outcome variables (QuickDASH, feelings, and phrases) with the continuous predictors. Independent Student's *t* test was used to find significant

dichotomous predictors of the outcome variables; one-way ANOVA was used for categorical variables.

Variables which were significant or had a *p* value of less than 0.08 in the bivariate analysis were inserted in a stepwise backward multivariable regression analysis for feelings, phrases, and QuickDASH. We planned not to include patient's self-rating of health or pain as explanatory variables in the regression for QuickDASH since we consider both response variables.

Results

The mean QuickDASH score was 26±19 points (range, 0–89), the mean phrases score was 23±9.1 (range, 9–44), and the mean feelings score was 13±5.5 (range, 5–25). The mean PSEQ score was 48±12 (range, 11–60), and the mean pain was 3.6±2.5 (range, 0–8) (Table 3).

Most questions of the phrases and feelings correlated significantly with the other questions (correlation coefficient ranged between $r=0.14$ and $r=0.90$). Question c of the feelings (It feels like something serious; correlation coefficient ranged between $r=0.27$ and $r=0.71$) and question 2 of the phrases (I'm feeling weak; correlation coefficient ranged between $r=0.37$ and $r=0.61$) had the largest correlation with the other questions (Table 4). Phrases question 7 ("I can't do even simple things") had the largest correlation of all phrases ($r=0.62$, $p<0.001$) with feelings questions a (I don't trust my arm) and b (I can't depend on my arm) (Tables 4 and 5).

Both the phrases questionnaire and feelings questionnaire showed an adequate internal consistency (Cronbach's alpha was 0.86 for the phrases questionnaire and 0.88 for the feelings questionnaire), and the intraclass correlation coefficient was 0.85 for the phrases questionnaire and 0.87 for the feelings questionnaire. The phrases questionnaire had a small correlation with education and a large correlation with QuickDASH, showing convergent and divergent validity. Feelings had a medium correlation with patient's self-rating of health and a large correlation with QuickDASH (Table 6). The floor effect was 4.8 % for the phrases questionnaire and

Table 3 Outcome measures

Questionnaires	<i>n</i> =83 Mean	SD	Range
QuickDASH ^a	26	19	0–89
Feelings	13	5.5	5–25
Phrases	23	9.1	9–44
PSEQ	48	12	11–60
Pain	3.6	2.5	0–8

PSEQ pain self-efficacy questionnaire

^a Short version of the disabilities of the arm, shoulder, and hand questionnaire

Table 4 Correlation of the individual questions of the phrases with phrases and feelings

Pearson's correlation, $n=83$																			
	1	2	3	4	5	6	7	8	9										
	r	p	r	p	r	p	r	p	r	p									
Phrases																			
2	I'm feeling weak	0.57	<0.001	1.00															
7	I can't do even simple things	0.46	<0.001	0.60	<0.001	0.55	<0.001	0.44	<0.001	0.48	<0.001								
4	I have excruciating pain	0.52	<0.001	0.55	<0.001	0.72	<0.001	0.67	<0.001	1.00	0.49	<0.001	0.34	0.001					
6	The pain is unbearable	0.52	<0.001	0.44	<0.001	0.76	<0.001	0.76	<0.001	0.72	<0.001	0.40	<0.001	0.38	<0.001				
1	I'm dropping things	1.00		0.57	<0.001	0.45	<0.001	0.37	0.001	0.67	<0.001	0.40	<0.001	0.23	0.037				
8	It's moving along my arm	0.30	0.006	0.48	<0.001	0.52	<0.001	0.26	0.018	0.52	<0.001	0.46	<0.001	0.30	0.006	0.41	<0.001		
3	My hand gets numb	0.45	<0.001	0.61	<0.001	0.40	<0.001	0.32	0.003	0.40	<0.001	0.49	<0.001	1.00	0.29	0.008			
9	There's swelling	0.41	<0.001	0.41	<0.001	0.26	0.020	0.11	0.33	0.37	0.001	0.33	0.002	0.34	0.001	0.14	0.20		
5	I have a high threshold for pain	0.26	0.018	0.37	0.001	0.38	<0.001	0.33	0.003	0.23	0.037	0.34	0.001	0.29	0.008	1.00			
Feelings																			
a	I don't trust my arm	0.47	<0.001	0.61	<0.001	0.36	0.001	0.42	<0.001	0.18	0.098	0.45	<0.001	0.62	<0.001	0.41	<0.001	0.40	<0.001
b	I can't depend on my arm	0.49	<0.001	0.61	<0.001	0.38	<0.001	0.39	<0.001	0.17	0.12	0.43	<0.001	0.62	<0.001	0.41	<0.001	0.31	0.005
c	It feels like something serious	0.53	<0.001	0.60	<0.001	0.51	<0.001	0.57	<0.001	0.27	0.015	0.52	<0.001	0.55	<0.001	0.39	<0.001	0.32	0.003
d	If we don't do something, it will only get worse	0.40	<0.001	0.46	<0.001	0.32	0.003	0.42	<0.001	0.33	0.002	0.40	<0.001	0.41	<0.001	0.26	0.020	0.14	0.20
e	When I feel pain, I'm causing more damage	0.29	0.008	0.38	<0.001	0.20	0.070	0.42	<0.001	0.23	0.034	0.31	0.004	0.32	0.003	0.29	0.008	0.22	0.050

Table 5 Correlations of the individual questions of the feelings with phrases and feelings

Pearson's correlation, Feelings <i>n</i> =83		c		a		b		d		e	
		<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Phrases											
2	I'm feeling weak	0.60	<0.001	0.61	<0.001	0.61	<0.001	0.46	<0.001	0.38	<0.001
7	I can't do even simple things	0.55	<0.001	0.62	<0.001	0.62	<0.001	0.41	<0.001	0.32	0.003
4	I have excruciating pain	0.57	<0.001	0.42	<0.001	0.39	<0.001	0.42	<0.001	0.42	<0.001
6	The pain is unbearable	0.52	<0.001	0.45	<0.001	0.43	<0.001	0.40	<0.001	0.31	0.004
1	I'm dropping things	0.53	<0.001	0.46	<0.001	0.49	<0.001	0.40	<0.001	0.29	0.008
8	It's moving along my arm	0.39	<0.001	0.41	<0.001	0.41	<0.001	0.26	0.020	0.29	0.008
3	My hand gets numb	0.51	<0.001	0.36	0.001	0.38	<0.001	0.32	0.003	0.20	0.070
9	There's swelling	0.32	0.003	0.40	<0.001	0.31	0.005	0.14	0.20	0.22	0.050
5	I have a high threshold for pain	0.27	0.015	0.18	0.098	0.17	0.12	0.33	0.002	0.23	0.034
Feelings											
a	I don't trust my arm	0.65	<0.001	1.00		0.90	<0.001	0.55	<0.001	0.40	<0.001
b	I can't depend on my arm	0.70	<0.001	0.90	<0.001	1.00		0.54	<0.001	0.39	<0.001
c	It feels like something serious	1.00		0.65	<0.001	0.70	<0.001	0.71	<0.001	0.52	<0.001
d	If we don't do something, it will only get worse	0.71	<0.001	0.55	<0.001	0.54	<0.001	1.00		0.67	<0.001
e	When I feel pain, I'm causing more damage	0.52	<0.001	0.40	<0.001	0.39	<0.001	0.67	<0.001	1.00	

16 % for the feelings questionnaire. Ceiling effect was 0 % for the phrases and 1 % for the feelings.

Phrases and feelings scores had a large correlation with each other ($r=0.69$). Both the phrases and feelings scores correlated moderately with QuickDASH and PSEQ (correlation coefficient ranged between $r=0.51$ and $r=0.66$) (Table 6).

The phrases scores were also associated with PSEQ, feelings, pain, patient's self-rating of health, had treatment before, other pain conditions, and had prior surgery. Smoking and education satisfied the criteria for entry in the regression. The best model for phrases when feelings were included in the model consisted of feelings, other pain conditions, and PSEQ (adjusted $R^2=0.56$, $p<0.001$), and a model without feelings contained pain, PSEQ, smoking, and other pain conditions (adjusted $R^2=0.43$, $p<0.001$).

The feelings questionnaire was correlated with pain, phrases, PSEQ, patient's self-rating of health, had treatment before, had prior surgery, differences by marital status, phrases, and PSEQ. The best model for feelings had the variables pain, phrases, and differences by marital status (married compared to single) and explained 49 % of the variability in the feelings score ($p<0.001$). A model without phrases included PSEQ, pain, and differences by marital status (married compared to single) (adjusted $R^2=0.32$, $p<0.001$).

The variables phases, feelings, PSEQ, had treatment before, female sex, had prior surgery, other pain conditions, and differences by working status were inserted in the regression for QuickDASH. The variables phrases, PSEQ, had treatment before, and differences by working status (homemaker, retired, and workers compensation compared to full time) remained in the best model (adjusted $R^2=0.57$, $p<0.001$) (Table 7).

Table 6 Bivariate analysis

	Phrases		Feelings		QuickDASH ^a	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Pearson's correlation, <i>n</i> =83						
Age	0.014	NS	0.035	NS	0.19	0.099
Patient's self-rating of health	−0.40	<0.001	−0.30	0.006	−0.51	<0.001
Education	−0.20	0.070	−0.11	NS	−0.18	NS
Pain	0.49	<0.001	0.45	<0.001	0.65	<0.001
Phrases	1.00	1.00	0.69	<0.001	0.66	<0.001
Feelings	0.69	<0.001	1.00	1.00	0.57	<0.001
QuickDASH	0.66	<0.001	0.57	<0.001	1.00	1.00
PSEQ	−0.55	<0.001	−0.51	<0.001	−0.60	<0.001
<i>t</i> test	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
Treatment before	−2.5	0.016	−2.5	0.015	−3.1	0.002
Sex		NS		NS	2.4	0.021
Other pain conditions	−3.6	0.001		NS	−3.1	0.002
Prior surgery	−2.1	0.040	−3.2	0.007	−2.6	0.012
Smoking	−1.9	0.076	−1.7	0.084		NS
One-way ANOVA	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Diagnoses	1.8	0.089	1.7	NS	1.4	NS
Working status	1.3	NS	1.3	NS	5.0	<0.001
Marital status	1.9	NS	2.9	0.027	1.3	NS
Doctor	1.1	NS	1.5	NS	1.2	NS

PSEQ pain self-efficacy questionnaire

^a Short version of the disabilities of the arm, shoulder, and hand questionnaire

Table 7 Multivariable analysis of phrases, feelings, and QuickDASH

<i>n</i> = 83									
Phrases	Model	Adjusted R^{2b}	p	Partial R^{2c}	Feelings Model	Adjusted R^{2b}	p	Partial R^{2c}	QuickDASH ^a Model
Including feelings		0.56	<0.001		Including phrases	0.49	<0.001		
PSEQ				0.039	Pain			0.023	Phrases
Other pain conditions				0.048	Phrases			0.23	PSEQ
Feelings				0.21	Marital status (compared to single) Married				Treatment before
									Working status (compared to full time) Homemaker Retired Workers compensation
Excluding feelings		0.43	<0.001		Excluding phrases	0.32	<0.001		
Pain				0.057	Pain			0.059	
PSEQ				0.078	PSEQ			0.060	
Smoking				0.040	Marital status (compared to single) Married				
Other pain conditions				0.040				0.038	

PSEQ pain self-efficacy questionnaire^a Short version of the disabilities of the arm, shoulder and hand questionnaire^b Percentage of the overall variability in the dependent variable explained or accounted for by the independent variables in the model^c The individual contribution of each variable to the adjusted R^2

Discussion

The importance of patient language was demonstrated in patients with cancer and lower back pain and in patients in primary care [3, 5, 14]. A recent study found that specific patient expressions correlate with pain intensity and magnitude of disability in patients with hand and upper extremity illness [2]. The findings of the previous study were used to create a phrases and feelings questionnaire, and the aim of the study was to assess (1) the scores, (2) correlation between the individual questions, (3) validity, and (4) predictors of the phrases and feelings questionnaire.

This study should be viewed in the light of some shortcomings. The phrases and feelings questionnaire were designed based on the findings of a previous study [2], and this study explored the amount of variation in outcome measures that could be explained by the phrases and feelings. The actual scores as found with the phrases and feelings questionnaires might have been higher than what the cues the patients would have given to the surgeon. Since we did not use audio recordings, the actual number of uttered cues and the scores completed by the patients in the interview could not be compared. There might be a threshold for mentioning these phrases and feelings, and since we asked the patients to indicate the amount of using these phrases and feelings on a scale, this might have caused an overestimation. There were missing values for the QuickDASH questionnaire in two patients, and there were three missing questions in three patients for the phrases questionnaire. We used mean imputation for those missing values. We asked patients to rate what they would say and what they would feel separately, but it might not be possible to do this well on a questionnaire. We did not record comorbidities because in prior research, we found that medical comorbidities and psychiatric diagnoses are less strongly associated with symptoms and disability than current symptoms of depression and coping strategies [12, 16, 17]. These data only apply to patients for whom English is their first language. Different phrases might be used by patients using English as their second language. Finally, while our sample was adequately powered, it might not be large enough to ensure internal and external validity.

This study asked patients to identify with specific phrases that are commonly heard in a hand and upper extremity office and feelings that patients with hand illness may have. We found that the phrases were highly correlated with the feelings and that both were associated with greater pain intensity and magnitude of disability. Phrases were also highly correlated with coping strategies (PSEQ).

This work builds on prior work that has consistently found that patients with greater psychological distress use cues to get the attention of health-care providers [3–5, 18]. As in all areas of the body, pain and psychological factors are important mediators of disability patients with hand and upper extremity

illness [6, 10, 12, 15–17]. This study showed that what patients say reflects their mindset and coping strategies. When hand and upper extremity specialists learn to recognize certain phrases as indicators of psychological distress and ineffective coping strategies, this raises new opportunities for increased health and wellness as these factors are quite responsive to treatment with cognitive behavioral therapy. Self-efficacy can be taught and practiced. Unfortunately, it can be difficult to discuss these aspects of human illness behavior due to the relative mind–body dichotomy and the stigma associated with the cognitive and emotional aspects of human illness behavior.

The probability of both discrete pathophysiologies as well as the probability that addressing discrete pathophysiology will lessen symptoms and disability are both lower in patients with low self-efficacy and high illness concerns. Phrases that reflect these aspects of human illness behavior should prompt hand specialists to redouble their efforts to convey empathy, better coordinate care as one part of an interdisciplinary team led by the primary care provider, and resist the temptation to offer low-yield, potentially counterproductive tests and treatments.

Conflict of Interest The authors declare that they have no conflict of interest.

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This study was approved by our human research committee. All patients provided informed consent.