Correspondence of Patient Word Choice with Psychologic Factors in Patients With Upper Extremity Illness

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Abstract

Background Studies of patients with back pain, cancer, and in a general medical practice note that the use of certain phrases by a patient when communicating with their health provider can indicate greater disability and distress than expected for patients with a given disorder. However, it is unclear whether such phrases apply to patients with hand and arm disorders.

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All ICMJE Conflict of Interest Forms for authors and *Clinical Orthopaedics and Related Research* editors and board members are on file with the publication and can be viewed on request. Each author certifies that his or her institution approved the human protocol for this investigation, that all investigations were conducted in conformity with ethical principles of research, and that informed consent for participation in the study was obtained. This work was performed at the Orthopaedic Hand and Upper Extremity Service, Massachusetts General Hospital, Boston, MA, USA.

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Questions/purposes We assessed whether specific patient phrases are associated with symptoms, disability, and psychologic factors in patients with hand and arm disorders.

Methods We recorded and coded 61 interviews of new patients. Specific expressions of patients were listed and categorized into six phrase categories: “I can’t”, “Find it and fix it”, “Something is wrong”, “It’s serious”, “Deemphasis (hoping)”, and “Protective mindset”. Patients completed questionnaires for arm-specific disability (DASH), depression (Patient Health Questionnaire [PHQ-9]), pain catastrophizing (Pain Catastrophizing Scale [PCS]), and heightened illness concern (Whiteley Index).

Results Patients who endorsed phrases in the category “I can’t” had higher scores on the PCS, Whiteley, DASH, and pain; they also had longer visits. Patients expressing “Something is wrong” had higher scores for the PCS, pain, and duration of visit. Patients using “It’s serious” had a higher score for pain. Finally, patients using “Protective mindset” had lower PHQ-9 scores and younger age.

Conclusions Patient word choice may indicate underlying distress or ineffective coping strategies that represent important opportunities for empathy and support, including evidence-based cognitive and behavioral interventions.

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Introduction

Symptoms, disability, and patient satisfaction are determined not only by pathophysiology and technical issues (ie, the operative technique or medication) but also by the patient's psychologic profile [1, 9, 10, 25, 26, 38], and effective communication with the health provider [7, 15, 36]. Patient word choice can reflect illness behavior and also correlates with satisfaction [23]. This study aims to confirm these findings in a hand surgery practice.

Word choice can reveal coping strategies or state of mind to the health provider. For instance, when patients with low back pain use phrases that indicate deterioration such as "wear and tear", "collapsing", "the spine is crumbling", and "disc space loss", they tend to believe their situation will worsen (eg, "not get better", "end up in a wheelchair") [33].

The Roter Interaction Analysis System (RIAS) is a widely used system for rating provider-patient interactions to evaluate the communication of patients and providers [28, 29, 32]. The RIAS system also counts the number of statements by the patient and doctor during an encounter. Shaw et al. [31, 32], using the RIAS, found patients with low back pain for more than 3 months after initial presentation who spoke mostly about the biomedical rather than the psychosocial aspects of their illness and communicated greater disapproval, criticism, complaints, and disbelief ("no, I don't think so", "I thought you said I wouldn't need pills") during their initial visit, were less likely to return to their usual work. An increased number of patient statements correlated with greater dysfunction and pain at the initial visit [31]. Patients who thought their back problem would last for a long time in the future, their back problem had a great influence on their life, or the problem could not be controlled reportedly were more likely to have higher disability scores as measured with the Roland Morris Disability Questionnaire (RMDQ) [14].

Patients presenting to their general practitioner with more distress (according to the General Health Questionnaire 12 [11]) were more likely to give cues to the physician in the form of psychologic expressions (emotions, worries, feelings) or social expressions (events or situations referring to work, finance, family, or other interpersonal relationships) [11]. Among patients with cancer, younger patients and female patients apparently give more emotional cues or signals for needed emotional support (eg, "I get so upset sometimes that I can't stop crying") than other patients [8]. We wondered if the

phrases used by a patient could inform providers of hand and upper extremity care.

We therefore asked whether specific categories of phrases were associated with (1) greater disability, (2) greater pain intensity, (3) more symptoms of depression, and (4) greater catastrophic thinking controlling for demographics, diagnoses, and duration of visit.

Patients and Methods

For this study, we used data from the first 67 patients enrolled in a prospective, institution review board-approved cross-sectional cohort study that used recordings of visits of English-speaking adult patients to evaluate provider communication styles. Doctors were not scripted and routine visits were recorded. The purpose of the larger cohort study is to explore the quality of informed shared decision making in an orthopaedic hand and upper extremity practice and how it relates to patient satisfaction, coping, and depression. The setting was an orthopaedic hand and upper extremity practice in a tertiary-care hospital that also serves a broad primary care network. All patients were new to our office and enrolled between June 2009 and March 2011. For this study, we used the recordings to evaluate patient word choice. Informed consent was obtained before enrollment. Audio recording failed in six patients owing to mechanical problems, leaving 61 recordings for analysis. There were 26 men and 35 women (57%), with a mean age ($\pm$ SD) of 55 ± 16 years (range, 18–79 years). Their marital status, education, and other painful body regions were recorded (Table 1). Twenty-nine patients worked full time (48%), seven worked part time (12%), one was a homemaker (2%), 15 were retired (25%), four were unemployed but able to work (7%), and five were unemployed but unable to work (8%). Their diagnoses were collected from their medical records (Table 2). One patient did not complete the questions about having other pain and smoking.

A researcher (AGJB) not involved in the patients' care made a transcript of all the recorded interviews. All specific phrases used by the patients in the interviews were extracted from the transcript and listed. We also recorded the duration of the encounter with the healthcare provider. Two authors (AGJB and DCR, one of whom was not involved in the patients' care), independently analyzed and categorized these phrases. There were six categories constructed by consensus, after analyzing the tapes, as follows: (1) "Find it and fix it" phrases where the patient expresses hope placed in the provider that he/she can cure the problem (eg, "You mean I have to live with it", "Will the pain go away?", "Is it fixable?", "Are you saying it's all in my head?"); (2) "It's serious" included phrases expressing

Table 1. Patient demographics

Variable	Number of patients
Number of patients	61
Age (years)*	55 (18–79)
Sex	
Women	35 (57%)
Men	26 (43%)
Marital status	
Single	18 (29.5%)
Living with partner	2 (3.3%)
Married	28 (45.9%)
Separated/divorced	6 (9.8%)
Widowed	7 (11.5%)
Years of education*	15.8 (12–22)
Smoking	
Yes	10 (16.4%)
No	50 (82%)
Missing	1 (1.6%)
Other areas of pain	
Yes	26 (42.6%)
No	34 (55.7%)
Missing	1 (1.6%)
Working status	
Full-time	29 (47.5%)
Part-time	7 (11.5%)
Homemaker	1 (1.6%)
Retired	15 (24.6%)
Unemployed, able to work	4 (6.6%)
Unemployed, unable to work	5 (8.2%)
Patient self-rating of health*	2.5 (0–9)

* Values are expressed as mean, with range in parentheses.

the severity of the problem such as “excruciating”, “unbearable”, “The pain kills me”, “Like someone is sticking a knife in my hand”); (3) “Something is wrong” phrases expressing heightened illness concern (eg, “It hurts more than it did”, “I have a high threshold for pain”, “It goes up my arm”); (4) “I can’t” phrases expressing the impact of symptoms on activities (eg, “This is as far as it goes”, “The pain is so severe, I cannot use my...anymore”, “I drop things”); (5) “Protective mindset” phrases describing avoidance of symptoms and vulnerability (ie, “The more I do, the more it swells/hurts”); and (6) “Deemphasis (hoping)” phrases where patients compare themselves with patients with more severe disease (ie, “It probably isn’t serious...”, “I’m sure this is the simplest thing you’ll see all day”). Each patient received a score of 0 (no use of phrase) or 1 (use of phrase) for each of the six categories of phrases. For each patient, the total number of phrase categories used (ie, a maximum of six) also was

Table 2. Diagnoses of the patient cohort (n = 61)

Diagnosis	Number of patients
Osteoarthritis	12 (20%)
Carpal tunnel syndrome	8 (13%)
Idiopathic chronic arm pain	8 (13%)
Lateral epicondylitis	6 (10%)
Dupuytren’s disease	6 (9.8%)
Finger trauma*	5 (8.2%)
Ganglion	4 (6.6%)
Trigger finger	3 (4.9%)
De Quervain tenosynovitis	2 (3.2%)
Midcarpal instability	1 (1.6%)
Chronic olecranon bursitis	1 (1.6%)
Anterior interosseous nerve syndrome	1 (1.6%)
Medial epicondylitis	1 (1.6%)
Rotator cuff tendinopathy	1 (1.6%)
Onychomycosis	1 (1.6%)
Lump	1 (1.6%)

* Mallet finger, proximal interphalangeal joint sprain, thumb ligament sprain, injuries to finger, and phalanx fracture.

recorded. We assumed equal weight of all phrase categories to calculate this number.

We evaluated arm-specific disability using the validated DASH questionnaire [17]. The DASH consists of 30 questions scored on 5-point Likert scales, ranging from 1 (no problems/pain) to 5 (impossible). Scores range between 0 and 100 points, a higher score indicating worse upper extremity-specific disability and pain [17]. The DASH is widely used and has been validated as a measure of upper extremity disability [3, 4]. Pain was scored on a VAS, ranging from 0 to 10 cm, where 0 was no pain and 10 the worst pain ever. The VAS is a reliable method to measure pain and has been used in numerous studies [6, 12, 18, 30]. Patients marked their pain on the scale and the distance in centimeters was measured. Two patients did not complete the pain score, so we used mean imputation as a substitute. Symptoms of depression were measured using the validated Patient Health Questionnaire (PHQ)-9 [19], which contains nine questions answered on a 4-point Likert scale, ranging from 0 (not at all) to 3 (nearly every day). The PHQ-9 was validated in a large cohort of 6000 patients [19]. Scores from 0 to 27 are possible, where higher scores indicate more depressive symptoms [37]. Two patients had one missing question on the PHQ-9. We used mean imputation for unanswered questions. We used the Pain Catastrophizing Scale (PCS) to measure misinterpretation or overinterpretation of nociception (catastrophic thinking), with a higher score indicating a more exaggerated negative orientation toward pain [35]. This scale is validated to determine the tendency toward excessively negative interpretation of nociception as indicating harm and hopelessness. One PCS

questionnaire was missing, and mean imputation was used for the statistical analysis. One other patient had one missing question on the PCS. We used mean imputation for this unanswered question. The Whiteley Index [24] was used to assess heightened illness concern. This questionnaire contains 14 questions scored using a 5-point Likert scale, ranging from 1 (not at all) to 5 (a great deal). A higher score indicates more disease illness concern in the patient [24]. The Whiteley Index is a validated score to measure heightened illness concern [2, 24, 34]. Three patients had one missing question on the Whiteley Index. We used mean imputation for unanswered questions. Patients also were asked to self-rate their health on an 11-point Likert scale, with 0 being as healthy as can be and 10 as unhealthy as can be. Two patients did not complete the self-rating of health, so we used mean imputation.

Preliminary analyses involved means and SDs for continuous variables and frequencies for categorical variables. Based on the number of patients in our cohort we assumed normality and used parametric tests for our analysis. To address our purposes we assessed differences in DASH, PCS, pain, and PHQ-9 between patients using phrases in a certain category and compared them with patients who did not use them, using a t-test. Because the number of patients using a specific phrase or not using a specific phrase could differ, we used unequal variance t-tests [21]. We compared patients using phrases in four or five categories with patients who used phrases in one category with t-tests. To detect differences in demographics, diagnoses, and time of encounter between patients using specific phrases with patients who did not, we used chi-square tests and Fisher's exact tests when fewer than five patients were in one of the compared categories. To enhance the ability to detect statistical influences for the phrase categories (some categories had more patients than others), we combined categories in marital status (reduced from six to three groups: single, living with partner/married, separated/divorced/widowed), working status (reduced from six to four groups: full-time, part-time/homemaker, retired, unemployed able/unable to work), and diagnoses (reduced from 16 to six groups: osteoarthritis, carpal tunnel syndrome/interosseous nerve syndrome, idiopathic chronic arm pain, lateral/medial epicondylitis/rotator cuff tendinopathy, Dupuytren disease/trigger finger/de Quervain syndrome/finger trauma, other). To correct for multiple t-test comparisons to answer our hypotheses, we also performed false discovery rate correction procedure tests for multiple comparisons [5].

Results

Phrases in the category "I can't" were verbalized in 21 patients, "Find it and fix it" in 35, "Something is wrong" in 40, "It's serious" in 10, "Deemphasis" in eight,

and "Protective mindset" in 18. Forty-five patients (74%) expressed phrases in multiple categories; therefore, there was a mean number of 2 ± 1 categories in each interview (Table 3).

The mean PCS score was 8 ± 9 points, mean Whiteley Index was 23 ± 10 , mean PHQ was 3 ± 4 points, and mean DASH score was 24 ± 18 points. The mean VAS score for pain was 4 ± 3 cm and mean duration of visit was 15 ± 7 minutes (Table 4). Addressing our hypotheses in order: First, phrases in the category "I can't" and use of phrases from more than one category were associated with greater disability (DASH scores) (Table 5). Second, phrases in the categories "Something is wrong," and "I can't" were associated with greater pain intensity (Table 5). Third, phrases in the category "Protective mindset" were associated with less depression (Table 5). Fourth, phrases in the categories "Something is wrong," and "I can't" were associated with greater catastrophic thinking (Table 5). There were no differences in phrases by diagnoses or demographic factors after correction with false discovery rate correction (Table 5).

Discussion

Studies in various medical fields have established the quality of provider-patient communication and specific

Table 3. Categories of patient phrases

Category*	Number of patients
"I can't"	21 (34%)
"Find it and fix it"	35 (57%)
"Something is wrong"	40 (66%)
"It's serious"	10 (16%)
"Deemphasis (hoping)"	8 (13%)
"Protective mindset"	18 (30%)
Number of phrases per patient†	2.3 (1–5)

* Multiple phrase categories possible in an interview; † values are expressed as mean, with range in parentheses.

Table 4. Outcome of questionnaires

Variable	Value
Pain Catastrophizing Scale	7.8 (0–39)
Whiteley Index	23 (14–62)
DASH	24 (0–75)
Patient Health Questionnaire	3.0 (0–17)
VAS score for pain (cm)	4.0 (0–9.5)
Duration of visit (minutes)	15 (3–33)
Patient self-rating of health	2.5 (0–9)

Values are expressed as mean, with range in parentheses.

Table 5. Statistical analysis of phrase categories

Test/variable	p value					
	“I can’t”	“Find it and fix it”	“Something is wrong”	“It’s serious”	“Deemphasis”	“Protective mindset”
t-test						
Age	0.74	0.15	0.36	0.27	0.044 (t = - 2.3)	0.045 (t = 2.1)
VAS score for pain	< 0.001 (t = - 3.9)	0.009 (t = 2.7)	0.001 (t = - 3.4)	0.016 (t = - 2.8)	0.63	0.65
Education in years	0.40	0.24	0.71	0.085	0.68	0.34
Patient self-rating of health	0.37	0.24	0.30	0.71	0.34	1.0
Pain Catastrophizing Scale	0.005 (t = - 3.0)	0.26	0.004 (t = - 3.0)	0.10	0.91	0.43
Whiteley Index	0.021 (t = - 2.4)	0.12	0.39	0.31	0.96	0.70
Patient Health Questionnaire	0.062	0.23	0.027 (t = - 2.3)	0.91	0.50	0.001 (t = 3.6)
DASH	< 0.001 (t = - 5.1)	0.53	0.052	0.37	0.98	0.67
Duration of visit	0.021 (t = - 2.4)	0.26	0.020 (t = - 2.4)	0.67	0.059	0.22
Chi-square or Fisher’s exact						
Sex	0.031* ($\chi^2 = 4.6$)	0.32	0.097	0.30	0.12	0.19
Other areas of pain	0.85	0.89	0.96	0.64	0.45	0.046
Smoking	1.0	0.29	1.0	0.35	0.33	0.71
Marital status	0.16	0.27	0.66	0.12	0.74	0.88
Working status	0.80	0.011 ($\chi^2 = 11$)	0.46	0.93	0.60	0.25
Diagnosis	0.22	0.19	0.10	0.46	0.58	0.14

* This expression was used more frequently by women.

patient language are associated with greater symptoms and disability. We therefore determined whether specific categories of phrases were associated with (1) greater disability, (2) greater pain intensity, (3) more symptoms of depression, and (4) greater catastrophic thinking controlling for demographics, diagnoses, and duration of visit.

This study should be viewed in the light of its limitations. First, the categorization into six categories may not be reliable compared with the use of questionnaires or validated communication categorization tools such as the RIAS. We formed the categories by consensus, which makes it impossible to give interobserver reliability values. This might decrease the validity of our conclusions as the categories were created by us. Second, the majority of patients used multiple phrase categories, but we did not score the number of expressions in each category and the categories were not mutually exclusive. However, the aim of the study was to provide answers if categories of phrases would result in different scores in the variables of interest. If we also would have scored the number of expressions in each category by each patient, this would have resulted in numerous additional statistical comparisons. Third, one surgeon conducted most of the interviews, which limits the ability to determine the influence of the provider. We do not think this jeopardized our results, as the surgeons were not scripted and the study focuses on the patient’s language. Fourth, we used mean imputation for two patients with missing pain

scale and self-rating of health, which may weaken our conclusions toward pain and self-rating of health. Missing data are encountered frequently in clinical research [13, 16, 27], but we had nearly complete data. Fifth, we performed multiple t-tests but addressed this with a false discovery rate correction analysis [5] to account for false-positive significant associations. Without this correction we increase the risk that some of our findings are false positives.

It makes sense that phrases in the “I can’t” category were associated with greater disability, because these phrases address perceived limitations. The finding that patients using expressions from different categories have higher DASH scores is consistent with the evidence that symptom intensity and disability correlate with psychologic distress and ineffective coping strategies [20, 22]. The same is true for the observation that greater pain intensity is associated with phrases in the “Something is wrong” and “I can’t” categories, both of which also were associated with greater catastrophic thinking in response to nociception. The only finding that is inconsistent and therefore difficult to explain is that use of phrases in the “Protective mindset” category was associated with fewer symptoms of depression on average. The finding that patient language is associated with symptoms, disability, and psychologic factors in patients with hand and arm illnesses is in agreement with similar studies of patients with other types of illnesses [7, 15, 23, 36].

Table 6. Interpretation of patient phrases

	Study category	Interpretation
The patient says:		
Excruciating. Unbearable. It's killing me	It's serious	Help!
I have a high threshold for pain;	Something is wrong	It's difficult to believe that I'll be OK
It goes up my arm;		
It hurts even when I'm not doing anything		
You mean I have to live with it?	Find it and fix it	I can't rely on my hand unless we fix this
Are you saying it's all in my head?		
I can't even dry my hair;	I can't	It's disabling
I'm dropping things		
It swells when I use it;	Protective mindset	I feel vulnerable.
I have to limit what I do with my arm		
I'm sure this is the simplest thing you'll see all day	Deemphasis	I hope you'll understand how I feel

This study with two different healthcare providers found that patient word choice can reveal mindset and illness behavior/coping strategies to the caregiver (Table 6). We suggest, when providers notice patients using phrases that reflect important thoughts and emotions that reflect distress, this is an opportunity to express empathy and legitimize the patient's concerns. Providers should be aware of the phenomenon of stress contagion, where the patient's distress and need for action transfers to the provider creating the potential for excessive, unnecessary, or unhelpful tests and interventions. When a patient requests help with more effective strategies for managing the thoughts and emotions that accompany their illness, be prepared to refer the patient to an expert in cognitive behavioral therapy or a related approach, preferably one who has worked with patients who have disproportionate symptoms and disability.

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