Comparison Study

Do Acute and Chronic Pain Patients Differ on Affirmation of One Aspect of Pain Acceptance? Acknowledgement that a Cure Is Unlikely

David A. Fishbain, MD[1,2,3], Daniel Bruns, PsyD[4], Laura J. Meyer, PhD[5], John E. Lewis, PhD[1], Jinrun Gao, MS, MBA[6], and John Mark Disorbio, EdD[7]

From: [1]Miller School of Medicine at University of Miami, Departments of Psychiatry, [2]Neurological Surgery, and Anesthesiology; [3]Department of Psychiatry at Miami Veterans Administration Hospital; 4Health Psychology Associates, Greeley, Colorado; [5]Graduate School of Professional Psychology, University of Denver, Denver, Colorado; [6]American International Group, New York, NY; [7]Independent Practice, Lakewood Colorado

Address Correspondence:
David Fishbain, MD
University Health Psychiatry
University of Miami
Miller School of Medicine
1695 N.W. 9th Avenue (D-79)
Suite 3302L
Miami, FL 33136
E-mail: d.fishbain@miami.edu

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Background: Many chronic pain patients (CPPs) cannot be cured of their pain, but can learn to manage it. This has led to research on pain "acceptance" which is defined as a behavior pattern with awareness of pain but not directed at changing pain.

Objective: CPPs who have accepted their pain generally acknowledge that a cure is unlikely. Time with pain may be necessary to reach such an acknowledgment. It was therefore hypothesized that fewer acute pain patients (APPs) than CPPs should affirm that a cure is unlikely and that other described aspects of acceptance such as denial of disability status should be associated with cure is unlikely in both APPs and CPPs.

Study Design: APPs and CPPs were compared for frequency of endorsement of 2 items/questions with face validity for cure is unlikely: little hope of getting better from pain (LH) and physical problem (pain) can't be cured (CBC). Demographic variables and variables reported associated with acceptance were utilized in logistic prediction models for the above items in APPs and CPPs.

Setting: Rehabilitation programs/offices.

Results: CPPs were statistically more likely than APPs to affirm both LH and CBC. In both APPs and CPPs, items reported associated with acceptance, e.g., denial of disability status, predicted LH and CBC.

Limitations: Information gathered from CPP self-reports.

Conclusions: APPs versus CPPs differ on their affirmation on acknowledgement that a cure is unlikely.

Key Words: Acceptance, pain acceptance, chronic pain, acute pain, chronic pain patients, acute pain patients, Battery of Health Improvement (BHI 2), cure disability, illness uncertainty

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Psychological approaches to chronic pain have evolved from an operant behavioral approach of the 1960s – 1970s to a cognitive behavioral approach (1). This last approach is characterized by self-management methods such as distraction and relaxation and research variables such as coping, catastrophizing, and self-efficacy (1). A more recent approach has seen the development of a mix of control

and acceptance based methods to deal with pain. This is termed contextual cognitive behavioral therapy for chronic pain (2). This shift has led to an emphasis on the development of research on acceptance as an important variable in the process of patients' responses to chronic pain.

There is not a single agreed upon definition for acceptance of chronic pain (3), the most recent one being "a behavior pattern that happens with awareness of pain but is not directed at changing pain or is otherwise influenced by pain" (1). Additionally, a number of operationally defined behavior patterns or aspects of the chronic pain patients (CPPs) with pain acceptance have been described by the acceptance literature. These are the following: acknowledgment that a cure is unlikely and that pain may not change (4-6); willingness to have pain (7-8) without feeling the need to control it or eliminate it (1); giving up unproductive attempts to control pain (9-10); shift from search for a cure (6); less attention to pain (8); shift to non-pain aspects of life (5,6,9-12); and acting as if pain does not necessarily imply disability (9-10).

In CPPs, research on pain acceptance has mainly proceeded by the use of the Chronic Pain Acceptance Questionnaire (CPAQ) (13-15). Here prospective and retrospective studies have demonstrated that acceptance is a reliable predictor of functioning in CPPs (1,16). Some experimental pain induction studies have also demonstrated that patients in the acceptance condition vs. patients in control-oriented conditions achieve greater pain tolerance (17-22). To our knowledge, there are no studies comparing different pain groups such as acute pain patients (APPs) to CPPs for aspects of acceptance of pain.

The belief that a cure is unlikely (one aspect of acceptance) should theoretically be time dependent; the longer the patient has pain in spite of physician treatment, the more likely he/she is to realize that a cure is unlikely. Therefore, APPs should be less likely to acknowledge that a cure is unlikely versus CPPs as they would be exposed to pain and pain treatment for a shorter duration of time. Therefore, the first hypothesis of this study was that CPPs are more likely to affirm that a cure is unlikely versus APPs. The second hypothesis of this study was that some other aspects of acceptance, e.g., denial of disability status, should be associated with acknowledgment that a cure is unlikely. The study below tests the above hypotheses in APPs and CPPs.

Methods

Patients

This is a study from a data pool of 600 items/questions previously utilized to develop the Battery for Health Improvement 2 (BHI 2), which is made up of a subset of items from this data pool (23).The 600 items/questions had been administered to 777 randomly selected patients undergoing rehabilitation treatment for pain or a physical injury. They had been recruited from 30 states in all geographical regions of the continental United States. Participants were recruited by posters or flyers given to them by their health care providers and came from a variety of settings: physical therapy, work hardening programs (interdisciplinary programs that focus on employability and return to work through progressive increases in work simulation time periods), chronic pain programs, physician offices, and vocational rehabilitation settings. Patients were from various payer systems (Medicare/Medicaid, private insurance, worker's compensation, and personal injury insurance). Their non-specific and specific diagnoses are presented here as a percentage of the total rehabilitation patient group (n = 777) (some patients had more than one diagnosis): low back injury associated pain 44.4% (n = 345); lower extremity injury associated pain 25.4% (n = 197); upper extremity injury associated pain 25.2% (n = 196); headache pain 12.2% (n = 95); head injury associated pain 11.2% (n = 87); non-whiplash cervical sprain associated pain 8.1% (n = 63); whiplash associated pain 6.8% (n = 53); carpal tunnel syndrome 6% (n = 47); thoracic outlet syndrome 2.2% (n = 17); reflex sympathetic dystrophy 1.4% (n = 11); and fibromyalgia 1.4% (n = 11). These non-specific and specific diagnoses were received from the treating facilities either before referral to the facility or during treatment. We have no information as to what types of physicians assigned these diagnoses. Of these 777 rehabilitation patients, 667 had a pain (Numerical Rating Scale [NRS] score greater than zero) and 110 had no pain. One of the data pool items was a horizontal 10 cm numerical rating scale anchored at 0 (no pain or discomfort) and 10 (worst pain or discomfort I can imagine having). Using this scale, and considering all of the pain-affected parts of the body, the patients were asked to rate both the highest average and the lowest average pain experienced in the last month. Of patients with pain, 341 suffered from chronic pain (CPPs; greater than 90 days duration) (there was an item in the data pool on the duration of pain). The remaining patients (n = 326) had

acute pain (APPs; less than 90 days duration). The CPP and APP groups were segregated for further analysis and are the focus of this study.

The 600 data pool items are not an inventory and contain no scales; therefore, they have no associated reliability and validity data. However, each item had one-week test-retest reliability scores. The 600 data pool items had test-retest reliability scores ranging from a low of 0.81 to a high of 0.89. Additional variables, such as demographic variables, were also collected with the data pool items.

Data Collection Procedures

Participation was by self-selection: Participating physicians were requested to offer entrance to all patients, the only exclusion criteria being less than 18 years or over 65 and not being able to read the data pool items. Patients were offered a reimbursement of $60.00 for their participation. No patients invited to participate refused and any patient wishing to participate in the data pool collection study was allowed study entrance.

The data pool items were administered in a confidential manner (questionnaires were assigned a random ID number). No records were kept regarding which ID number a patient or non-patient was assigned. The data were processed by persons having no contact with, or knowledge of, the respondents. Data were also de-identified of names, dates, telephone numbers, social security numbers, and medical record numbers as per HIPAA requirements. All groups signed an informed consent form advising the subjects/patients of the risks and benefits of participation in completing the data pool items. The consent form indicated that the information would be used for research purposes, one of those being to develop a new questionnaire for medical patients and the other being the type of research presented here. The consent form also indicated that no results or feedback would be given; the information gathered from the data pool items would not influence the course of clinical care. The consent form had been developed by an internal committee at Pearson Assessments whose function was to monitor the process of information gathering into the data pool at the various sites. Before implementation, the consent form was sent out for approval to an external IRB that approved the consent form. The internal committee also reported on the process of information gathering and consent form implementation to the external IRB. The data pool set was presented for BHI 2 development in a de-identified format and years later also in a de-identified format for further analysis as in this study.

Data Analysis

Data analysis was performed on 2 patient groups: APPs and CPPs. Response groups (affirmation vs. non-affirmation) for all items utilized in the analyses were established as follows: items had been scored on a Likert scale with the responses being strongly disagree, disagree, agree, and strongly agree (assigned scores 0 through 3, respectively). For the analyses described below, items were transformed into a dichotomy, such that participants were classified as affirming the item if they agreed or strongly agreed. We decided to dichotomize the variables because we were interested in demonstrating whether a belief was present/not present as this issue is important clinically for treatment. Also, the scales were such that they enabled us to clearly identify whether a patient affirmed/did not affirm the belief. In addition, dichotomization allowed us to use logistic regression in the analysis, which in turn allowed us to analyze both continuous and dichotomous variables (there were some continuous variables).

Of the 600 items, 2 items were chosen as the dependent variables as they operationally represented the belief that a cure is unlikely: little hope from getting better from pain (LH) and physical problem (pain) can't be cured (CBC). The following items were chosen to be the independent variables in the analyses: gender, education, ethnicity, worker's compensation status, personal injury status, injury litigation status, injury type, insurance type, medical setting, employment status, smoking status, marital status, history of neck and lower back surgeries, and frequency of cigarette smoking. The following items were also chosen as independent variables: I will probably have poor health for the rest of my life (belief in continued poor health), my pain never changes (an aspect of acceptance), and I am not disabled (an aspect of acceptance).

Data were analyzed using SPSS 20.0 software. First chi-square analyses were conducted to assess differences in affirmation for the dependent variables LH and CBC between APPs and CPPs. Then chi-square analyses were used to assess the association between the 2 dependent variables, the above independent variables and the BHI-2's 18 scales (the BHI-2 scales were scored from the responses to the data pool items by the subjects/patients in the 2 groups [APPs and CPPs] under study. For a full list of these scales and details of the reliability/validity of the scales, please refer to pre-

vious publications (24-26). Note that the 2 dependent variables were not included in any of the BHI-2 scales. If a BHI-2 scale was significantly different then the scale was subjected to further analysis. All of the items (questions) that were subsumed under that scale were then analyzed by chi-square to assess their individual significance as categorical variables.

Multivariate analyses of variance (MANOVA) were then conducted to look for group differences between patients who affirmed the items LH and CBC and those who did not on demographic, pain, and BHI 2 scale variables for both APPs and CPPs. For the MANOVA, we employed a very strict alpha level (.001) to choose variables that were significant. Our rationale for selecting such a restrictive alpha value was that it would reduce the risk of false-positives caused by performing multiple statistical tests. Use of this restrictive alpha minimized the risk of committing a Type I error and of the possibility of spurious findings. The items selected in this manner were used as independent variables in 2 stepwise logistic regression models (one using the LH and the other using CBC) as the dependent variables to assess the predictability of agreement with these 2 items. Two final logistic regression analyses were conducted to assess the predictability of agreement with the 2 items using significant scale items and their associated individual items as predictors. The logistic regression analyses were performed separately for APPs and CPPs.

Results

Table 1 displays the total number and percentage of the totals of the number of patients who endorsed the item LH for APPs and CPPs. This table also presents chi-square comparisons for frequency of affirmation (agree) for the item LH for APPs vs. CPPs.

Table 2 displays the total number and percentage of the totals of the number of patients who endorsed the item CBC for APPs and CPPs. This table also presents chi-square comparisons for frequency of affirmation (agree) for the item CBC for APPs vs. CPPs.

Final Logistic Regression Models to Predict Affirmation of the Believe Condition Incurable Item as the Dependent Variable with Significant Independent Variables for APPs and CPPs

For APPs in the initial chi square/MANOVA analyses, a number of variables were statistically significant at the $P < .001$ level and were used as potential predictors in an initial logistic regression model using the believe condition incurable {CBC?} item as the dependent variable. The final model chi-square was significant ($\chi^2 = 54.21$, $P < .001$) and explained 27.1% of the variance in the dependent variable according to Nagelkerke R2. The significant predictors were belief in disabled status (Wald = 13.73, $P < .001$), belief in continuing poor health (Wald = 17.86, $P < .001$), and years injured (Wald = 6.35, $P < .05$). The model overall classified 79.2% of the patients correctly, which was higher than the base rate prediction of 74%. Sensitivity of the model was 31.9% and specificity was 95.9% (Table 3).

For CPPs in the initial chi square/MANOVA analyses, a number of variables were also statistically significant at the $P < .001$ level and were used as potential predic-

Table 1. *Number, percentage, and chi-square group comparisons (APPs vs. CPPs) of patients affirming little hope of getting better from pain.*

Category	Total n	Yes to Acceptance (n, %)
Acute Patients with Pain	326	88 (27%)
Chronic Patients with Pain	341	157 (46%)
Chi-square score and P value between Acute Pain Patients and Chronic Pain Patients		X2 = 26.02 $P < 0.001$

Table 2. *Number, percentage, and chi-square group comparisons (APPs vs CPPs) for patients affirming physical problems (pain) can't be cured.*

Category	Total n	Yes to Acceptance (n, %)
Acute Patients with Pain	326	45 (13.8%)
Chronic Patients with Pain	341	82 (24%)
Chi-square score and *P* value between Acute Pain Patients and Chronic Pain Patients		X2 = 11.34 $P = .001$

tors in an initial logistic regression model using the believe condition incurable {CBC?} item as the dependent variable. The final model chi-square was significant ($\chi 2$ = 89.76, P < .001) and explained 30.9% of the variance in the dependent variable according to Nagelkerke R2. The significant variables were belief in disabled status (Wald = 15.92, P < .001), belief in continuing poor health (Wald = 31.94, P < .001), and feeling forced to prove that something is wrong (Wald = 9.11, P < .005). The model overall classified 70.4% of the patients correctly, which was higher than the base rate prediction of 54%. Sensitivity of the model was 62.4% and specificity was 77.2% (Table 3).

Final Logistic Regression Models to Predict Affirmation of the Little Hope of Getting Better Item as the Dependent Variable with Significant Independent Variables for APPs and CPPs

For APPs in the initial chi square/MANOVA analyses, a number of variables were statistically significant at the P < .001 level and were used as potential predictors in an initial logistic regression model using the no hope of getting better item as the dependent variable. The final model chi-square was significant ($\chi 2$ = 90.10, P < .001) and explained 43.8% of the variance in the dependent variable according to Nagelkerke R2. The significant predictors were the items reflecting belief in continuing poor health (Wald = 21.98, P < .001), pain never changes (Wald = 7.47, P < .01), and 2 items associated with the Depression scale item: can't bear to think about things I can no longer do (Wald = 6.29, P < .05) and only half the person I used to be (Wald = 8.52, P < .005). The model overall classified 88.7% of the patients correctly, which was slightly higher than the base rate prediction of 86.2%. Sensitivity of the model was 42.2% and specificity was 96.1% (Table 4).

For CPPs in the initial chi square /MANOVA analyses, a number of variables were statistically significant at the P < .001 level and were used as potential predictors in an initial logistic regression model using the no hope of getting better item as the dependent variable. The final model chi-square was significant ($\chi 2$ = 98.78, P < .001) and explained 37.6% of the variance in the dependent variable according to Nagelkerke R2. Significant predictors included belief in continuing poor health (Wald = 42.30, P < .001), feeling forced to prove something is wrong (Wald = 13.44, P < .001), and pain never gets better (Wald = 13.91, P < .001). The model overall classified 83% of the patients correctly, which was higher than the base rate prediction of 76%. Sensitivity of the model was 53.7% and specificity was 92.3% (Table 4).

Discussion

This study investigated 2 items (LH and CBC), which represent the central concept of acceptance in APPs and CPPs. Our first hypothesis was that a greater frequency of CPPs than APPs would affirm both of these items

Table 3. *Logistic regression results for prior significant independent variables and individual items with physical problems can't be cured as the dependent variable: APPs and CPPs.*

Stepχ^2 (df), P value	% of Cases Predicted Correctly by the Model	Step Nagelkerke R2	Variable	Associated BHI-2 Scale	B	Wald, P value	Odds Ratio	Lower 95% CI for Odds Ratio	Upper 95% CI for Odds Ratio
Acute Pain Patients									
29.78 (1), < .001	76.2	.16	Denial of disabled status	Functional Complaints	1.73	29.25, < .001	5.66	3.02	10.59
45.70 (2), < .001	78.5	.23	Belief in continuing poor health	NA	-1.42	16.16, < .001	.24	.12	.48
54.21 (3), < .001	79.2	.27	Years injured	NA	.12	6.35, < .05	1.13	1.03	1.24
Chronic Pain Patients									
61.41 (1), < .001	71.0	.22	Belief in continuing poor health	NA	-1.91	53.74, < .001	.15	.09	.25
80.54 (2), < .001	71.0	.28	Denial of disabled status	Functional Complaints	1.09	18.99, < .001	2.97	1.82	4.84
89.76 (3), < .001	70.4	.31	Forced to prove something wrong	NA	-.83	9.11, < .005	.43	.25	.75

Table 4. *Logistic regression results for prior significant independent variables and individual items with little hope of getting better from pain item as the dependent variable: APPs and CPPs.*

Stepχ^2 (df), *P* value	% of Cases Predicted Correctly by the Model	Step Nagelkerke R2	Variable	Associated BHI-2 Scale	B	Wald, *P* value	Odds Ratio	Lower 95% CI for Odds Ratio	Upper 95% CI for Odds Ratio
Acute Pain Patients									
60.08 (1), < .001	86.2	.30	Belief in continuing poor health	NA	-2.76	56.12, < .001	.06	.03	.13
74.95 (2), > .001	88.0	.37	Can't bear to think	Depression	1.05	14.28, < .001	2.86	1.66	4.92
82.86 (3), < .001	87.7	.41	Half a person	Depression	.74	7.84, < .005	2.09	1.25	3.50
90.10 (4), < .001	88.7	.44	Pain never changes	NA	-1.39	7.47, < .01	.25	.09	.67
Chronic Pain Patients									
64.98 (1), < .001	76.5	.26	Belief in continuing poor health	NA	-2.17	57.66, < .001	.11	.06	2.0
85.37 (2), < .001	83.3	.33	Pain never changes	NA	-1.46	20.26, < .001	.23	.12	.44
13.41 (3), < .001	83.0	.38	Forced to prove something wrong	NA	-1.13	13.44, < .001	.32	.17	.59

because CPPs would be in pain for a greater period of time. This was indeed the case: for both items, CPPs were statistically more likely than APPs to affirm these items. This finding is important as it indirectly supports the theoretical tenets of the acceptance concept.

The second hypothesis of this study was that items that have face validity for some other aspects of the acceptance concept, e.g., denial of disability status, should be associated with the central concept of acceptance. This was also the case. For both APPs and CPPs, the following items involving other aspects of acceptance (4-6,9-10) predicted the dependent variables: denial of disabled status (APPs, CPPs), belief in continuing poor health (APPs, CPPs), and pain never gets better (APPs, CPPs). This result supports the theoretical underpinnings of the acceptance concept. It is also to be noted that years injured also predicted CBC in APPs.

Previous literature has also linked pain acceptance to psychological distress (27) and less depression (28-33). Our data indicates that for LH (APPs) some depression items were predictive. This result then indirectly supports the previous literature and is supported by it.

In reference to whether actual pain levels are associated with acceptance, the literature is inconsistent. Some studies have indicated that lower pain levels are associated with acceptance (30,32,33) and some have shown that there is no association whatsoever (11,27,31,34). In this study, pain levels were not predictive of either of the 2 dependent items. As such, our results support and in turn are supported by part of this literature.

The final item that proved to be predictive for both of the dependent items for CPPs was that of forced to prove something is wrong. This is not an item/concept previously associated with the concept of acceptance. However, we have previously demonstrated that CPPs often have problems with illness uncertainty (24). Here, there is diagnostic uncertainty for the patient's pain, which is transmitted to the patient by the physician (24). The patient then begins to believe that the doctor thinks the problem is in his/her head and that he/she needs to prove the problem is real (24). It appears, therefore, that elements of illness uncertainty may be associated with acceptance in CPPs. As this is a new finding, it will need to be replicated.

What are the potential confounders to the results of this study? First, the community patients were stratified to match U.S. census data but were not randomly selected. Second, this study was cross-sectional. Third, subjects/patients were paid for their participation and this could have affected random selection also. Fourth, we used the current time definitions of acute pain

versus chronic pain to separate our patients into these groups. However, there is no consensus regarding the optimal time duration to separate acute from chronic (35). Fifth, although these results were statistically significant, they were not compelling with respect to the amount of variance explained, percentage of patients correctly classified, sensitivity, and specificity. One of the reasons for this is our base rate of 86% which is very difficult to beat with a regression equation. However the odds ratio results were pretty good. As such, we are confident in our results which, however, should be interpreted with caution. Sixth, we used the accepted time definition of acute versus chronic pain. However, it is unclear what amount of time, if any, is necessary for a patient to accept their pain. Nevertheless our results indicate that even with the use of this acute versus chronic time definition, the patients are responding to the dependent variables differentially.

Is there any clinical utility to the results of this study? All our models were better than the base rate prediction. As such, the variables presented in Tables 3 -4 could have some clinical utility in predicting whether the patient believes his/her pain is incurable. As this is one of the central concepts of acceptance (introduction), it is likely that such a patient would be ready/willing to accept their pain or have already accepted it. The literature reviewed in the introduction indicates that the state of pain acceptance is clinically desirable in helping the patient cope with pain. As such, it would be advantageous to identify patients who have accepted their pain versus those who have not. Thus patients who deny their disability status or do not believe in continuing poor health or do not complain that pain never changes could be construed to likely have accepted their pain and as such be directed towards self-management techniques. All others could be screened for acceptance with the Chronic Pain Acceptance Questionnaire (13-15). Patients scoring low on this questionnaire would then be candidates for individual or group counseling designed to move them towards pain acceptance.

Conclusions

Overall, these results utilizing comparisons between APPs and CPPs support the general theoretical construct of acceptance.

References

1. McCracken LM, Vowles KE. Acceptance of chronic pain. *Current Pain and Headache Reports* 2006; 10:90-94.
2. McCracken LM. *Contextual Cognitive-Behavioral Therapy for Chronic Pain*. IASP Press, Seattle, 2005.
3. McCracken LM, Vowles KE, McLeod C, Eccleston C. A subgroup analysis in chronicpain: Further evidence for a dual component model of acceptance of pain. *The Journal of Pain* 2009; 10:S63.
4. Lachapelle DL, Lavoie S, Boudreau A. The meaning and process of pain acceptance: Perceptions of women living with arthritis and fibromyalgia. *Pain Research & Management* 2008; 13:201-210.
5. Risdon A, Eccleston C, Crombez G, McCracken L. How can we learn to live with pain? A Q-methodological analysis of the diverse understandings of acceptance of chronic pain. *Social Science & Medicine* 2003; 56:375-386.
6. Viane I, Crombez G, Eccleston C, Poppe C, Devulder J, Van Houdenhov B, De Corte W. Acceptance of pain is an independent predictor of mental well-being in patients with chronic pain: Empirical evidence and reappraisal. *Pain* 2003; 106:65-72.
7. McCracken LM, Eccleston C. A prospective study of acceptance of pain and patient functioning with chronic pain. *Pain* 2005; 118:164-169.
8. Fish RA, McGuire B, Hogan M, Morrison TG, Stewart I. Validation of the chronic pain acceptance questionnaire (CPAQ) in an Internet sample and development and preliminary validation of the CPAQ-8. *Pain* 2010; 149:420-421.
9. McCracken LM. Learning to live with the pain: Acceptance of pain predicts adjustment in persons with chronic pain. *Pain* 1998; 74:21-27.
10. McCracken LM, Sperrus IL, Janeck AS, Sinclair D, Wetzel FT. Behavioral dimensions to adjustment in persons with chronic pain: Pain-related anxiety and acceptance. *Pain* 1999; 80:283-289.
11. Viane I, Crombez G, Eccleston C, Devulder J, De Corte W. Acceptance of the unpleasant reality of chronic pain: Effects upon attention to pain and engagement with daily activities. *Pain* 2004; 112:282-288.
12. Gyurcsik NC, Brawley LR, Spink KS, Glazebrook KE, Anderson TJ. Is level of pain acceptance differentially related to social cognitions and behavior? The case of active women with arthritis. *Journal of Health Psychology* 2011; 16:530-539.
13. McCracken LM, Vowles KE, Eccleston C. Acceptance of chronic pain: Component analysis and a revised assessment method. *Pain* 2004; 107:159-166.
14. Vowles KE, McCracken LM, McLeod C, Eccleston C. The chronic pain acceptance questionnaire: Confirmatory factor analysis and identification of patient subgroups. *Pain* 2008; 140:284-291.
15. Mason VL, Mathias B, Skevington SM. Accepting low back pain: Is it related to a good quality of life? *Clin J Pain* 2008; 24:22-29.
16. Chiros C, O'Brien WH. Acceptance, appraisals, and coping in relation to migraine headache: An evaluation of interrelationships using daily diary methods. *Journal of Behavioral Medicine* 2011; 34:307-329.
17. Richardson EJ, Ness TJ, Doleys DM, Baños JH, Cianfrini L, Richards JS. Depressive symptoms and pain evaluations among persons with chronic pain: Catastrophizing, but not pain acceptance, shows significant effects. *Pain* 2009;

147:147-152.

18. Masedo AL, Rosa Esteve M. Effects of suppression, acceptance and spontaneous coping on pain tolerance, pain intensity, and distress. *Behaviour Research & Therapy* 2007; 45:199-209.
19. Branstetter-Rost A, Cushing C, Douleh T. Personal values and pain tolerance: Does a values intervention add to acceptance? *J Pain* 2009; 10:887-892.
20. McMullen J, Barnes-Holmes D, Barnes-Holmes Y, Stewart I, Luciano C, Cochran A. Acceptance versus distraction: Brief instructions, metaphors and exercises in increasing tolerance for self-delivered electric shocks. *Behaviour Research & Therapy* 2008; 46:122-129.
21. Páez-Blarrina M, Luciano C, Gutiérrez-Martinez O, Valdivia S, Ortega J, Rodriguez- Valverde M. The role of values with personal examples in altering the functions of pain: Comparison between acceptance-based and cognitive-control-based protocols. *Behaviour Research & Therapy* 2008; 46:84-97.
22. Gutiérrez O, Luciano C, Rodríguez M. Comparison between an acceptance-based and a cognitive-control-based protocol for coping with pain. *Behavior Therapy* 2004; 35:767-783.
23. Bruns D, Disorbio JM. *Battery for Health Improvement 2 Manual*. Pearson, Minneapolis, 2003.
24. Fishbain DA, Bruns D, Disorbio JM, Lewis JE, Gao J. Exploration of the illness uncertainty concept in acute and chronic pain patients vs. community patients. *Pain Med* 2010; 11:658-669.
25. Fishbain DA, Bruns D, Meyer LJ, Lewis JE, Gao J, Disorbio JM. Exploration of the relationship between disability perception, preference for death over disability and suicidality in patients with acute and chronic pain. *Pain Med* 2012; 13:552-561.
26. Fishbain DA, Bruns D, Lewis JE, Disorbio JM, Gao J, Meyer LJ. Predictors of homicide-suicide affirmation in acute and chronic pain patients. *Pain Med* 2011; 12:127-137.
27. Wright MA, Wren AA, Somers TJ, Goetz MC, Fras AM, Huh BK, Rogers LL, Keefe FJ. Pain acceptance, hope, and optimism: Relationships to pain and adjustment in patients with chronic musculoskeletal pain. *The Journal of Pain* 201; 12:1155-1162.
28. McCracken LM, Zhao-O'Brien J. General psychological acceptance and chronic pain: There is more to accept than the pain itself. *Eur J Pain* 2010; 14:170-175.
29. Hirsh A, Kratz A, Molton I, Ehde D, Jensen M. Pain acceptance is associated with key psychosocial outcomes in adults with multiple sclerosis and chronic pain. *The Journal of Pain* 2011; 12:76.
30. Fish RA, McGuire B, Hogan M, Morrison TG, Stewart I. Validation of the chronic pain acceptance questionnaire (CPAQ) in an Internet sample and development and preliminary validation of the CPAQ-8. *Pain* 2010; 149:420-421.
31. Nicholas MK, Asghari A. Investigating acceptance in adjustment to chronic pain: Is acceptance broader than we thought? *Pain* 2006; 124:269-279.
32. McCracken LM, Eccelston C. Coping or acceptance: What to do about chronic pain? *Pain* 2003; 105:197-204.
33. McCracken LM. Learning to live with the pain: Acceptance of pain predicts adjustment in persons with chronic pain. *Pain* 1998; 74:21-27.
34. Poppe C, Crombez G, Devulder J, Hanoulle I, Vogelaers D, Petrovic M. Personality traits in chronic pain patients are associated with low acceptance and catastrophizing about pain. *Acta Clinica Belgica* 2011; 66:209-215.
35. Chanda ML, Alvin MD, Schnitzer TJ, Apkarian AV. Pain characteristic differences between subacute and chronic back pain. *The Journal of Pain* 2011; 12:792-800.