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Evaluation of the Psychometric Properties of the Revised Short-Form McGill Pain Questionnaire (SF-MPQ-2)

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Abstract

The recently revised version of the Short-Form McGill Pain Questionnaire (SF-MPQ-2) was created to assess both neuropathic and non-neuropathic pain. The current study extends prior research by testing the reliability and validity of the SF-MPQ-2 in a sample of U.S. veteran patients with a range of chronic pain diagnoses. Participants (N = 186) completed the SF-MPQ-2, a sociodemographic questionnaire, the Structured Clinical Interview for the DSM-IV, and self-report pain and psychiatric measures. Pain diagnoses were extracted from the electronic medical record. The SF-MPQ-2 total and scale scores demonstrated good to excellent internal consistency. Convergent and discriminant validity were supported, and SF-MPQ-2 total and scale scores increased with number of pain diagnoses and pain severity. Confirmatory factor analyses indicated a four-factor model fit the data better than a single-factor model. However, high intercorrelations among the four latent constructs were observed, and a 2nd-order global pain construct also emerged. Overall, the SF-MPQ-2 demonstrated excellent reliability and validity in a sample of U.S. veteran patients with chronic neuropathic and non-neuropathic pain. Future psychometric studies of the SF-MPQ-2 should employ longitudinal data to evaluate the ability of scale scores to uniquely predict clinical and health service outcomes.

Keywords

Chronic Pain; McGill Pain Questionnaire; Psychometric; Reliability; Validity

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Introduction

The McGill Pain Questionnaire (MPQ) and its short-form version (SF-MPQ) have been widely used to assess characteristics of pain, particularly sensory and affective qualities.[14,15] The reliability and validity of these measures are well-documented,[12,16] and reports further indicate the SF-MPQ is among the measures most frequently used to assess pain in both clinical and research settings.[21] However, recent attention has focused on the limitations of existing global pain questionnaires such as the MPQ and SF-MPQ for the assessment of neuropathic pain, as relevant descriptions were not included in either questionnaire. As such, neuropathy-specific measures have been created to assess neuropathic pain;[3,10] however, these measures were not designed to assess non-neuropathic pain or co-morbid neuropathic and non-neuropathic pain,[8] thus limiting their utility to the assessment of pain in patients with a neuropathic pain diagnosis.

Recently, Dworkin and colleagues created a revised and extended version of the SF-MPQ (SF-MPQ-2) to assess *both* non-neuropathic and neuropathic pain.[8] In the original validation study, the SF-MPQ-2 demonstrated a four-factor structure that includes continuous, intermittent, neuropathic, and affective descriptors of pain in samples of treatment-seeking individuals with one to three self-reported chronic pain conditions who responded to a web survey (N = 882) and patients with diabetic neuropathic pain enrolled in a randomized clinical trial (N = 226). Across both samples, the SF-MPQ-2 demonstrated acceptable internal consistency, and initial support for convergent and discriminant validity was obtained. In the web survey sample, individuals with a greater number of self-reported co-morbid pain conditions scored higher on SF-MPQ-2 total and scale scores. The SF-MPQ-2 total and scale scores also demonstrated responsivity to patients' global impressions of change in the combined treatment and control conditions of the clinical trial.

Given the extension of the content of the SF-MPQ-2 to cover descriptors of both neuropathic and nociceptive pain, it is anticipated that it will be even more widely used as a general measure in research and clinical practice. However, the validation study by Dworkin and colleagues is, to our knowledge, the only published study to assess the psychometric properties of the SF-MPQ-2, and further validation that extends the formative research by including additional diverse patient populations and assessment methodologies is needed. The current study aimed to replicate web-survey findings by Dworkin and colleagues in a sample of U.S. veteran patients with diverse chronic pain diagnoses and extend prior research in three ways. First, the current study utilized clinical pain diagnoses identified in patient medical records to determine type and number of chronic pain diagnoses. This alleviates potential bias in patient self-reports of type and number of pain diagnoses and allows for verification of patient identity, which is difficult to ascertain in web surveys.[2,8] Second, unlike the original validation study, patients with four or more co-morbid pain diagnoses were included to capture the spectrum of chronic pain presentations in clinical populations. Finally, confirmatory factor analytic models examined properties of a single-factor model because a more parsimonious single-factor model may better describe the data than a four-factor model. In addition, the current study examined intercorrelations among the four latent factors in the four-factor model, which were not specifically examined in the in the original validation study by Dworkin and colleagues, because robust intercorrelations have been identified among factors in the MPQ and SF-MPQ, thus reducing discriminability between hypothesized pain constructs and potentially limiting the utility of discrete scale scores.[11,26,29]

Materials and Methods

Participants

This study was part of a larger project examining pain, substance use, and psychiatric symptomatology in United States veteran patients who received tests for hepatitis C virus infection. Participants were recruited by means of posted advertisements in the Veterans Affairs (VA) medical center where the study took place, letters sent to patients who had pending appointments in primary care, announcements made in mental health classes, and referrals from patients being treated in a hepatology clinic. Eligible participants were at least 18 years old, English speaking, had at least one pain diagnosis documented in their medical record, and reported experiencing current symptoms of, or receiving treatment for, chronic pain. To be included in the study, participants must have had a history of being tested for hepatitis C; both hepatitis C positive (n = 143) and negative (n = 78) patients were included. Exclusion criteria included age over 70 years, current unstable psychiatric disorder such as untreated schizophrenia or bipolar disorder, any pending litigation or disability compensation for pain, or advanced liver disease. Two hundred twenty-one patients met eligibility criteria for the current study. This study was approved by the Institutional Review Board of the VA Medical Center, and all participants provided written informed consent.

Chronic Pain Diagnoses and Opioid Prescription

Common chronic pain diagnoses were extracted from the electronic medical record using the Veterans Integrated Service Network-20 (VISN-20) Data Warehouse. Diagnoses included: neck or joint pain, low back pain, rheumatism/arthritis, migraine headache, neuropathy, fibromyalgia, and inflammatory bowel disease. The VISN-20 Data Warehouse extracts data from the clinical records of regional VA facilities and two national VA databases. Diagnoses were obtained using ICD-9-CM codes listed in medical encounter records for the five years prior to the study assessment. In addition, prescription opioid data for the 90 days prior to the study assessment were extracted from the electronic medical record.

Measures

Demographic characteristics—Psychosocial questionnaires assessed participant demographic characteristics including age, gender, race/ethnicity (Caucasian vs. Ethnic Minority), number of years of education (≤ 12 years vs. > 12 years), annual income (< $15,000 vs. ≥ $15,000), and marital status (single, never married vs. married vs. divorced/ separated vs. widowed).

Revised version of the Short-form McGill Pain Questionnaire (SF-MPQ-2).[8]— Participants completed the SF-MPQ-2 by rating the extent to which they experienced each of 22 pain descriptors in the past week using an 11-point numeric rating scale (0 = “none” to 10 = “worst possible”). The SF-MPQ-2 is comprised of four summary scales: (1) continuous descriptors (throbbing pain, cramping pain, gnawing pain, aching pain, heavy pain, and tender), (2) intermittent descriptors (shooting pain, stabbing pain, sharp pain, splitting pain, electric-shock pain, and piercing), (3) neuropathic descriptors (hot-burning pain, cold-freezing pain, pain caused by light touch, itching, tingling or ‘pins and needles’, and numbness), and (4) affective descriptors (tiring-exhausting, sickening, fearful, and punishing-cruel). A total pain score is computed by averaging participant ratings across all questions, while scale pain scores are derived from averaging ratings to questions that comprise the respective scales.

Other pain measures—Participants reported the year they were first diagnosed with chronic pain, and pain duration was computed from this variable. Participants’ perception of

pain severity and the extent to which pain interferes with their lives was assessed with the well-validated Multidimensional Pain Inventory (MPI) Severity and Interference scales, respectively.[13] The Pain Disability Index (PDI) was also completed.[25] This measure assesses additional functional domains in which pain caused disruptions, including sexual, recreational, self-care, and basic life-support activities.

Psychiatric measures—Two reliable and valid psychiatric symptom measures were administered to assess depression and anxiety symptoms experienced in the past two weeks: the Beck Depression Inventory, second edition[1] (BDI-II) and the Generalized Anxiety Disorder 7-Item (GAD-7) scale.[23] For both measures, higher scores indicate more severe symptoms of depression or anxiety, respectively.

Major depression and substance use disorders—Current major depressive disorder, as well as alcohol and substance use disorders, were assessed using the Structured Clinical Interview for DSM-IV (SCID), which has demonstrated excellent psychometric properties.[9] All SCID interviews were conducted by research assistants who had received extensive training and ongoing supervision by a licensed psychologist in diagnostic clinical interviewing and the SCID assessment tool.

Statistical Analyses

The factor structure of the SF-MPQ-2 was assessed with three confirmatory factor analysis (CFA) models using Mplus version 6 statistical package. CFAs employed maximum likelihood with robust standard error estimation. The first CFA examined model fit and factor loadings of all 22 SF-MPQ-2 items on a single latent factor. Because the SF-MPQ-2 has empirical support for a four-factor model comprised of each scale,[8] the second CFA compared fit of the one-factor model to that of a four-factor model in which scale items were only allowed to load on the specified factor (i.e., continuous, intermittent, neuropathic, or affective). Finally, similar to Holroyd and colleagues'[11] assessment of the MPQ factor structure, a 2nd-order CFA model was performed in which all four 1st-order latent factors of the SF-MPQ-2 loaded on a 2nd-order latent "global" pain factor. This model further assessed the discriminability of the four hypothesized SF-MPQ-2 factors and the presence of a global pain construct that jointly accounts for the continuous, intermittent, neuropathic, and affective qualities of pain. Similar to the original SF-MPQ-2 validation study, model fit was assessed with two absolute fit indices (Standardized Root Mean Square Residual [SRMR] < 0.08; Root Mean Square Error of Approximation [RMSEA] < 0.10). Two incremental fit indices (Tucker-Lewis Index [TLI] > 0.90; Comparative Fit Index [CFI] > 0.90) and a comparative measure of fit (Akaike Information Criterion [AIC]) were also evaluated. A Monte Carlo simulation evaluated observed power for all model path coefficients and latent-factor intercorrelations.[18]

Descriptive statistics examined the range of scores for the SF-MPQ-2 total and scale scores, and Cronbach's alpha measured internal consistency. Pearson product-moment correlations between SF-MPQ-2 scale scores and MPI Severity, MPI Interference, and PDI scores descriptively evaluated convergent validity. Cohen's[7] criterion of $r \geq 0.50$ for large effects was used to support convergent validity. We performed Hotelling-Williams t-tests for dependent samples[24] to compare correlations between SF-MPQ-2 scale scores and all pain and psychiatric measures to evaluate discriminant validity. Based on empirical findings from the original SF-MPQ-2 validation study by Dworkin and colleagues,[8] we hypothesized that correlations between the affective descriptors scale of the SF-MPQ-2 and psychiatric measures would be more robust than correlations between the three SF-MPQ-2 sensory pain scales (i.e., continuous pain, intermittent pain, and neuropathic pain) and psychiatric measures. We further hypothesized that SF-MPQ-2 sensory pain scales would correlate

more highly with pain severity, interference, and disability measures than would the SF-MPQ-2 affective descriptors scale.

Analysis of variance with Tukey's post-hoc pairwise tests compared SF-MPQ-2 total and scale scores between participants with 1 vs. 2 or 3 vs. 4 or more pain diagnoses and those with varying levels of pain severity. The following cutoff values for the MPI Pain Severity scale (minimum = 0, maximum = 6) were used to categorize the perceived intensity of participant's pain: none/mild = 0 to 2, moderate > 2 to 4, severe > 4. We hypothesized that SF-MPQ-2 total and scale scores would increase with number of pain diagnoses and severity of pain.

Graphical inspection of data and examination of descriptive statistics (e.g., skewness) were used to evaluate assumptions of inferential tests, including normality (for ANOVA) and linearity and homoscedasticity (for bivariate correlations). In addition, homogeneity of variance for ANOVA was assessed using Levene's test. All data met required assumptions. Two-tailed tests of significance and an α-level of $p < 0.05$ was used for all inferential analyses.

Results

Thirty-five of the 221 participants did not respond to all SF-MPQ-2 items. Participants with incomplete SF-MPQ-2 data did not significantly differ from participants with complete SF-MPQ-2 data across demographic, psychiatric, substance use, pain diagnosis, or other descriptive pain variables, including pain severity, pain interference, and pain disability (all ps > 0.05). Because incomplete SF-MPQ-2 data would preclude the conduct of some psychometric analyses, we excluded the 35 participants with any missing SF-MPQ-2 data, reducing the analytic sample for psychometric analyses to N = 186 patients.

Demographic and Clinical Characteristics of the Study Sample

Table 1 presents demographic and clinical characteristics of the study sample. In general, participants were middle-aged (mean age = 54.4 years), male (93%), and Caucasian (75%), which is consistent with the population of U.S. veterans with chronic pain residing in the Northwestern United States.[17] Patients on average reported being diagnosed with chronic pain for 14.5 years (SD = 11.9 years). Having more than one chronic pain diagnosis was the norm rather than the exception. Twenty percent of participants had a single chronic pain diagnosis, while 37% had 2–3 diagnoses and 43% had 4 or more diagnoses. Twenty percent of participants had been prescribed opioid medication for chronic pain in the last 90 days by a VA medical provider.

SF-MPQ-2 Factor Structure

All SF-MPQ-2 items were first constrained to load on a single latent factor. Results of this one-factor CFA demonstrated marginal fit (TLI = 0.82, CFI = 0.84, SRMR = 0.06, RMSEA = 0.09, AIC = 19129). A four-factor model demonstrated improved overall fit, as evidenced by increased TLI and CFI and reductions in RMSEA and AIC (TLI = 0.88, CFI = 0.89, SRMR = 0.06, RMSEA = 0.08, AIC = 18983). Table 2 provides standardized path coefficients for SF-MPQ-2 items and intercorrelations among the latent factors in the four-factor solution. Because of the high intercorrelations among latent factors in the four-factor model, ranging from 0.74 to 0.91, a 2nd-order CFA model was evaluated. This model demonstrated comparable fit to the 1st-order four-factor model (TLI = 0.88, CFI = 0.89, SRMR = 0.06, RMSEA = 0.08, AIC = 18981), and the 1st-order latent factors loaded highly on the 2nd-order factor, indicating the presence of a global pain construct that jointly accounts for continuous, intermittent, neuropathic, and affective qualities of pain.

Standardized path coefficients for continuous pain = 0.98, intermittent pain = 0.88, neuropathic pain = 0.94, and affective descriptors = 0.86. Monte Carlo simulation indicated observed power exceeded 0.99 for all tests of model path coefficients and latent-factor intercorrelations, indicating sufficient sample size to detect significant effects for all variables of interest in these models.

SF-MPQ-2 Item Descriptions and Scale Internal Consistency

Descriptive statistics for the SF-MPQ-2 total and scale scores are presented in Table 3. Scores spanned the entire continuum of possible scores for the continuous pain, intermittent pain, and affective descriptors scales. Few participants had scores at the low end, “floor” (i.e., scores of 0.00) for the total pain score or at the higher extreme, “ceiling” (i.e., scores of 10.00) for total or scale scores. However, the proportion of participants with scores at the floor for the four SF-MPQ-2 scales ranged from 8.1% to 28.5%. Internal consistency reliability was in the excellent range for SF-MPQ-2 total pain score (Cronbach’s alpha = 0.96) and in the good to excellent range for each of the SF-MPQ-2 pain scale scores (Cronbach’s alpha ranged between 0.84 and 0.92).

Convergent and Discriminant Validity

As presented in Table 4, moderate to high correlations were found between SF-MPQ-2 pain scale scores and other pain measures, ranging from 0.50 to 0.74. Correlations were weakest between the affective descriptors scale score as measured by the SF-MPQ-2 and other measures of pain severity, interference, and disability. The continuous pain scale score of the SF-MPQ-2 was most highly correlated with pain severity and disability, while the continuous and intermittent pain scales of the SF-MPQ-2 were most highly correlated with pain interference.

Correlations of psychiatric measures of depression and anxiety were strongest with the affective descriptors scale of the SF-MPQ-2 as predicted; however, the differences in correlation magnitude did not reach statistical significance (all ps > 0.05). Descriptively, correlations of pain severity, interference, and disability were generally strongest with the continuous, intermittent, and neuropathic SF-MPQ-2 pain scales, respectively, relative to the affective descriptors scale. T-values of these correlation coefficient comparisons are listed in Table 5. Table 4 contains r^2 values for bivariate correlations to facilitate comparison of effect size magnitude.

When comparing SF-MPQ-2 scale scores across patients with 1 vs. 2 or 3 vs. 4 or more pain diagnoses, scores varied as hypothesized. Patients with one pain diagnosis had the lowest SF-MPQ-2 total and scale scores, followed by patients with two or three pain diagnoses. Patients with four or more pain diagnoses had the highest SF-MPQ-2 total and scale scores. SF-MPQ-2 total and scale scores also varied across categories of pain severity, such that SF-MPQ-2 scores increased with pain severity (see Table 6).

Discussion

The current study evaluated the reliability and construct validity of the SF-MPQ-2 in a sample of U.S. veteran patients with diverse chronic pain diagnoses. Overall, the SF-MPQ-2 demonstrated good psychometric properties in this patient sample. Internal consistency was in the good to excellent range for SF-MPQ-2 total and scale scores, while convergent validity was supported by large correlations between SF-MPQ-2 and other pain measures. As predicted, SF-MPQ-2 total and scale scores increased with number of pain diagnoses and reported pain severity.

Although specific hypotheses about the discriminant validity of the SF-MPQ-2 were partially supported, the magnitude of the differences in correlations between some variables may be of modest clinical utility. For example, SF-MPQ-2 affective descriptors scale scores correlated more highly with depression and anxiety scores, relative to SF-MPQ-2 sensory pain scale scores. However, differences in effect size magnitude measured by r^2 ranged from 0.05 to 0.08, indicating that the affective descriptors scale accounted for only slightly more variance in psychiatric symptoms than the sensory pain scales. A similar pattern of findings was documented in validation studies of the MPQ that examined correlations between its scales and measures of psychiatric symptomatology.[4,11,27] This perhaps is not surprising given that the affective descriptors scale of the SF-MPQ-2 is not a surrogate measure for a psychiatric disorder but rather evaluates the emotional component of pain experience.

Differences in effect size magnitude, however, were most robust when comparing pain severity and pain interference with the four SF-MPQ-2 scales. The three sensory scales of the SF-MPQ-2 correlated more highly with pain severity and pain interference than the SF-MPQ-2 affective descriptors scale, and differences in effect size ranged from 0.08 to 0.30. These data suggest that high ratings of continuous, intermittent, and neuropathic pain may be most predictive of pain severity and pain interference ratings. Given the descriptive qualities of items on the SF-MPQ-2, this finding has implications for the treatment of pain. Specifically, techniques that reduce sensory perceptions of pain, such as cognitive-behavioral therapy, may in turn reduce the severity of individuals' pain experience and the extent to which pain interferes with activities of daily living, although prospective studies would be needed to test this hypothesis.

Although the original SF-MPQ-2 validation paper identified four factors,[8] the study did not report the intercorrelations among the factors. The current study supports a four-construct factor structure, but high intercorrelations among these factors and the presence of a 2nd-order global pain construct raise questions about the uniqueness of these constructs. This issue is not new within the family of McGill Pain Questionnaire psychometric studies. Turk and colleagues[26] identified intercorrelations among the MPQ sensory, affective, and evaluative pain constructs ranging from 0.64 to 0.81, while Holroyd and colleagues[11] identified intercorrelations among these constructs ranging from 0.60 to 0.80. Wright and colleagues[29] found a correlation of 0.89 between the sensory and affective pain constructs of the SF-MPQ. These findings, however, do not necessarily negate the potentially important differences between these scales, and the SF-MPQ-2 scale scores may have unique predictive utility, despite being highly correlated. Indeed, psychometric studies of the MPQ and SF-MPQ have shown that these measures can distinguish between different pain syndromes despite high correlations between scales.[19,20,22] Furthermore, knowledge of the way patients uniquely experience pain can increase understanding of underlying mechanisms and help clinicians tailor treatment by providing information that is not captured in simple numeric rating or visual analog scales of pain intensity. To further demonstrate the utility of the SF-MPQ-2, future studies should measure the predictive validity of the SF-MPQ-2 total and scale scores for criterion endpoints such as increased psychiatric symptomatology, health service utilization, lost wages due to an inability to work, and systemic costs such as use of unemployment and/or social security disability entitlements. A demonstration of the ability of the four scales of the SF-MPQ-2 to differentially predict these endpoints would provide additional support for the retention of a four-factor model. In the absence of current evidence that negates the predictive utility of the individual SF-MPQ-2 scales, we recommend the use of individual scales, rather than the total scale, to assess the characteristics of patients' pain.

The present findings provide additional psychometric support for the SF-MPQ-2 in a sample of patients with commonly diagnosed chronic pain syndromes treated at a VA medical

center who had been tested for hepatitis C. Although patients with hepatitis C experience high rates of chronic pain,[28] findings from this clinical population may not generalize to other clinical populations. It is notable that demographic characteristics and prevalence of specific pain syndromes in this sample are commensurate with those described in larger, regional samples of U.S. veterans with diverse chronic pain conditions,[17] suggesting this sample is representative of veterans with chronic pain.

Additional studies with other clinical populations are needed that address several specific psychometric characteristics of the SF-MPQ-2 that have not yet been investigated. First, although internal consistency of the SF-MPQ-2 was demonstrably high, test-retest reliability has yet to be assessed. Second, the original validation study did not examine SF-MPQ-2 scores between patients who were randomly assigned to treatment versus control. Future studies should evaluate the responsiveness of the SF-MPQ-2 to pain treatments to determine if reductions in SF-MPQ-2 scores are greater for those randomly assigned to an empirically supported pain treatment than those randomly assigned to a control condition. Such a demonstration would provide important evidence for the utility of the SF-MPQ-2 as an outcome measure in clinical trials. Third, one enhancement of the SF-MPQ-2 over the SF-MPQ is its increase from a 4- to 11-point (i.e., 0–10) numeric rating scale, which is believed to result in greater sensitivity to changes in pain experience.[8] While this makes intuitive sense, this supposition has not been empirically examined. Fourth, the SF-MPQ-2 may possess diagnostic utility and could be used as a chronic pain screening instrument in medical settings such as primary care clinics or in population epidemiological studies. However, future studies would first need to identify cut-off scores to differentiate between individuals with clinically significant levels of pain and those without that yield acceptable sensitivity, specificity, positive predictive power, and negative predictive power. Fifth, we purposefully did not attempt to distinguish between pain syndromes because 80% of the patient sample had two or more pain syndromes. Furthermore, we used standardized administration protocol of the SF-MPQ-2, which does not specify the location of pain to which respondents should reference when answering the questions. Future studies might consider, for example, modifying standard SF-MPQ-2 instructions and ask respondents to list then reference when responding to the most painful condition they currently experience. This would allow for SF-MPQ-2 comparisons across “most salient” pain syndromes in patients with multiple pain diagnoses. However, this can be a very difficult task for patients. Finally, as the compendium of studies that employ the SF-MPQ-2 increases, meta-analyses that pool data from diverse samples of persons with acute and chronic pain can help to further elucidate the psychometric properties of the SF-MPQ-2, identify moderating variables that describe characteristics of persons for whom the SF-MPQ-2 may have greatest utility, and/or allow for factorial invariance testing of CFA models[5] to determine if model factor structure differs based on patient conditions such as acute versus chronic pain, chronic pain related to cancer versus non-cancer diagnoses, or type of pain treatment received.

The SF-MPQ-2 was not designed to assess neuropathic or non-neuropathic pain solely.[8] Rather, it is a global measure that may better capture the pain experience of those with painful neuropathies than traditional pain measures. In the current study, only 10% of the participant sample was diagnosed with neuropathy, and all but one of these participants had at least one additional chronic pain diagnosis. An examination of the psychometric properties of the SF-MPQ-2 in individuals with neuropathic, but no other, pain conditions may provide more “pure” evidence of its utility in the assessment of neuropathic pain. However, findings from such a study may lack external validity because singular chronic pain diagnoses seem to be the exception rather than the norm, further supporting the utility of a general measure that assesses both neuropathic and non-neuropathic pain.

In conclusion, this study extended the original SF-MPQ-2 validation paper to a sample of patients with documented diverse chronic pain diagnoses and further elucidated the factor structure of this measure. Dworkin and colleagues[8] noted that the SF-MPQ-2 development was informed both by empirical findings and expert opinion, thus increasing the generalizability of the measure across samples because development did not rely solely on the nuanced empirical findings of a single sample. Findings in the current study were consistent with those of Dworkin and colleagues, and provide additional support for the reliability and validity of the SF-MPQ-2 in the assessment of chronic neuropathic and non-neuropathic pain.

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Perspective

This article presents the psychometric properties of a revised version of the Short-Form McGill Pain Questionnaire. This measure may have great utility as a screening tool in clinical practice and as an outcome measure in clinical trials.

Table 1

Demographic characteristics of a sample of U.S. veteran patients with chronic pain, N = 186.

Age	54.4 ± 7.7
Male Gender	92.5% (172)
White Race	75.3% (140)
Education Greater than 12 Years	76.9% (143)
Annual Income Less than $15,000	57.5% (107)
Marital Status	
Single, Never Married	22.6% (42)
Married	24.2% (45)
Divorced/Separated	48.9% (91)
Widowed	4.3% (8)
Current Major Depressive Disorder	27.6% (51)
Beck Depression Inventory-II	17.4 ± 12.8
Generalized Anxiety Disorder-7	8.7 ± 6.4
Current Substance User Disorder	15.6% (29)
Type of Chronic Pain Diagnosis	
Neck or Joint Pain	76.1% (140)
Low Back Pain	59.2% (109)
Rheumatism/Arthritis	53.8% (99)
Migraine Headache	21.2% (39)
Neuropathy	10.3% (19)
Fibromyalgia	9.8% (18)
Inflammatory Bowel Disease	2.7% (5)

Note: Column values indicate % (n) for categorical variables or Mean ± Standard Deviation for continuous variables.

Table 2

SF-MPQ-2 item path coefficients and intercorrelations among latent factors in a four-factor CFA, N = 186.

Standardized Path Coefficients	Continuous	Intermittent	Neuropathic	Affective
Throbbing pain	0.76			
Cramping pain	0.65			
Gnawing pain	0.72			
Aching pain	0.76			
Heavy pain	0.77			
Tender	0.67			
Shooting pain		0.86		
Stabbing pain		0.87		
Sharp pain		0.88		
Splitting pain		0.76		
Electric-shock pain		0.64		
Piercing		0.80		
Hot-burning pain			0.76	
Cold-freezing pain			0.61	
Pain caused by light touch			0.72	
Itching			0.61	
Tingling or ‘pins and needles’			0.75	
Numbness			0.74	
Tiring-exhausting				0.69
Sickening				0.83
Fearful				0.72
Punishing-cruel				0.78

Latent Factor Intercorrelations	Continuous	Intermittent	Neuropathic	Affective
Continuous	1.00			
Intermittent	0.88	1.00		
Neuropathic	0.91	0.83	1.00	
Affective	0.85	0.74	0.83	1.00

Note: All factor loadings and intercorrelations among latent factors are statistically significant ($p < 0.001$). CFA = Confirmatory Factor Analysis.

Table 3

Descriptive statistics and internal consistency for SF-MPQ-2 total and scale scores, N = 186.

SF-MPQ-2 total/scale score	Mean	SD	Floor [a] (%)	Ceiling [b] (%)	Range	Cronbach's alpha
Total Score	3.22	2.36	4.8	0.0	0.00–9.82	0.96
Continuous Descriptors	3.97	2.56	8.1	0.5	0.00–10.00	0.86
Intermittent Descriptors	3.45	2.84	15.1	1.6	0.00–10.00	0.92
Neuropathic Descriptors	2.64	2.41	12.4	0.0	0.00–9.67	0.85
Affective Descriptors	2.60	2.63	28.5	1.6	0.00–10.00	0.84

[a]Responded with minimum value;

[b]Responded with maximum value.

Table 4

Bivariate correlations and effect sizes between SF-MPQ-2 total/scale pain scores and other pain and psychiatric measures, N = 186.

Pain and Psychiatric Measures	SF-MPQ-2 Pain Scales									
	Total		Continuous		Intermittent		Neuropathic		Affective	
	r	r^2	*r*	r^2	*r*	r^2	*r*	r^2	*r*	r^2
MPI Severity Scale	0.72	0.52	0.74	0.55	0.68	0.46	0.63	0.40	0.50	0.25
MPI Interference Scale	0.66	0.44	0.64	0.41	0.64	0.41	0.57	0.32	0.50	0.25
Pain Disability Index	0.63	0.40	0.60	0.36	0.59	0.35	0.53	0.28	0.53	0.28
Beck Depression Inventory, 2nd Edition	0.41	0.17	0.35	0.13	0.37	0.14	0.36	0.12	0.44	0.19
Generalized Anxiety Disorder Scale	0.43	0.18	0.37	0.14	0.39	0.15	0.35	0.13	0.45	0.20

Note: All correlations are statistically significant ($p < 0.001$). MPI = Multidimensional Pain Inventory.

Table 5

T-values comparing correlation coefficients between SF-MPQ-2 Affective scale versus SF-MPQ-2 Continuous, Intermittent, and Neuropathic scales with other pain and psychiatric measures.

	SF-MPQ-2 Scale Comparisons		
	Affective Versus Continuous	**Affective Versus Intermittent**	**Affective Versus Neuropathic**
Pain and Psychiatric Measures	***t*-value**	***t*-value**	***t*-value**
MPI Severity Scale	−6.83 *	−4.12 *	−2.92 *
MPI Interference Scale	−3.47 *	−3.08 *	−1.50
Pain Disability Index	−1.69	−1.28	0.00
Beck Depression Inventory, 2nd Edition	1.92	1.32	1.56
Generalized Anxiety Disorder Scale	1.71	1.14	1.95

* $p < 0.05$.

Note: Critical value for Hotelling-Williams *t*-tests with 183 df = 1.97 for two-tailed α of 0.05.

Negative t-values indicate a lower affective scale correlation relative to the SF-MPQ-2 scale correlation to which it is compared.

Table 6

SF-MPQ-2 total and scale scores by pain severity and number of pain diagnoses, N = 186.

	Total	Continuous	Intermittent	Neuropathic	Affective
Number of Pain Diagnoses					
1 pain diagnosis, n = 38	2.44 ± 2.14 [a]	3.31 ± 2.49 [a]	2.23 ± 2.64 [a]	1.89 ± 2.00 [a]	2.27 ± 2.45 [a]
2 or 3 pain diagnoses, n = 69	2.97 ± 2.13 [a]	3.76 ± 2.38 [a,b]	3.27 ± 2.70 [a]	2.30 ± 2.26 [a]	2.32 ± 2.32 [a]
4 or more pain diagnoses, n = 79	3.81 ± 2.36 [b]	4.48 ± 2.66 [b]	4.19 ± 2.84 [b]	3.28 ± 2.57 [b]	3.01 ± 2.92 [a]
MPI Pain Severity					
None/Mild, n = 47	1.16 ± 1.69 [a]	1.48 ± 1.95 [a]	1.00 ± 1.87 [a]	0.99 ± 1.60 [a]	1.14 ± 1.96 [a]
Moderate, n = 92	3.08 ± 1.68 [b]	4.06 ± 1.79 [b]	3.43 ± 2.32 [b]	2.28 ± 1.81 [b]	2.25 ± 2.16 [b]
Severe, n = 47	5.55 ± 2.00 [c]	6.29 ± 2.06 [c]	5.92 ± 2.41 [c]	4.97 ± 2.38 [c]	4.75 ± 2.75 [c]

Note: Values indicate Mean ± Standard Deviation. Values with different subscripts significantly differ at the $p < 0.01$ level. MPI = Multidimensional Pain Inventory.