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Assessment

The Persian Version of the Chronic Pain Acceptance Questionnaire

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Research on the role of acceptance in adjustment to persisting pain has been facilitated by the development of the Chronic Pain Acceptance Questionnaire (CPAQ). However, the CPAQ has not yet been validated amongst Iranian patients with chronic pain. To examine the psychometric properties of the Persian version of the CPAQ (P-CPAQ), 245 Persian-speaking chronic pain patients completed a battery of questionnaires, including: the P-CPAQ, a Pain Self-Efficacy Questionnaire, a slightly modified Roland and Morris Disability Questionnaire, the Catastrophizing Scale of the Coping Strategies Questionnaire, the Depression and Anxiety Scales of the Depression Anxiety And Stress Scale-21 and the Pain-Related Interference and Pain Intensity Scales of the Multidimensional Pain Inventory. Furthermore, to evaluate the reliability of the P-CPAQ, the measure was completed by 24 chronic pain patients, on two occasions that are 2 weeks apart. The results of the principal component analysis and confirmatory factor analysis yielded a two-factor solution. Furthermore, the reliability and construct validity of the P-CPAQ were confirmed. In general, consistent with studies in other countries, the results of the present study indicate that pain acceptance plays an important role in adjustment to chronic pain regardless of cultural and language differences between countries. Copyright © 2012 John Wiley & Sons, Ltd.

Key Practitioner Message:
- Findings obtained with P-CPAQ provide support for the psychometric properties of the P-CPAQ in an Iranian chronic pain population.
- The P-CPAQ's psychometric strengths provide support for its use in both clinical and research settings.

Keywords: Chronic Pain, Acceptance, Validity, Reliability, Persian

INTRODUCTION

Chronic pain, a challenging health condition, is indeed a highly prevalent disease in both developed and developing countries. Amongst the Iranian population, estimates of chronic pain prevalence range from 14% (Asghari, 2005) to 21% (Ghaffari, Alipour, Jensen, Farshad, & Vingard, 2006). Although chronic pain is often mentioned as a disabling disease associated with a significant disruption of daily activities, scientific evidence suggests otherwise; it is not a disabling experience by itself, and in fact, how patients adjust with pain is significantly influenced by how they respond to the pain (Gatchel & Dersh, 2002; McCracken & Samuel, 2007; McCracken & Vowles, 2006; Turk & Melzack, 2001).

People with pain usually attempt to avoid experiencing pain. But when pain becomes chronic, struggling to avoid it is associated with the experience of greater distress and disability, whereas acceptance of chronic pain is associated with a higher level of daily emotional, social and physical functioning (Forman, Herbert, Moitra, Yeomans, & Geler, 2007; Hayes & Duckworth, 2006; McCracken, 1998; Viane *et al*., 2004; Wicksell, Melin, & Olsson, 2007). Acceptance of pain is defined by experiencing the pain without any attempt to control or avoid it, and instead focussing on valued activities (McCracken, Carson, Eccleston, & Keefe, 2004a; McCracken, Vowles, & Eccleston, 2004b).

Several measures have been developed to assess pain acceptance. Recently, Reneman, Dijkstra, Geertzen, and Dijkstra (2009) in a systematic review of the four questionnaires or subscales of pain acceptance (Chronic Pain Acceptance Questionnaire [CPAQ], Illness Cognitions Questionnaire, Pain Solutions Questionnaire and Acceptance of Illness Scale adapted to pain) have recommended that the CPAQ, based on its psychometric properties, is the preferred questionnaire in research as well as in clinical practice. In the same study, it is noted that 'the CPAQ appears to be the only questionnaire that is founded within a coherent theoretical framework of acceptance of chronic pain' (p.3).

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So far, the original English version of the CPAQ has been translated into several languages including Chinese (Ning, Chiming, Mae, & Ping, 2008), Spanish (Rodero *et al.*, 2010), German (Nilges, Köster, & Schmidt, 2007), Swedish (Wicksell, Melin, & Olsson, 2009) and Italian (Bernini, Pennato, Cosci, & Berrocal, 2010). The results of these studies have confirmed the CPAQ's validity and reliability. Despite the growing body of research on CPAQ, it is evident that the bulk of this research has been based on samples of patients in quite economically advanced countries. However, cultural factors have been shown to influence how one perceives and responds to pain (Gheldof, Jong, Vinck, & Houben, 2004; Turk & Monarch, 2002). Additionally, the recommendations of the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (Turk *et al.*, 2006) on pain outcome measures emphasize that when using a questionnaire in a culture other than the one for which it was originally developed, consideration must be given to whether the concepts are meaningful and are being interpreted similarly across cultures even if questions can be literally translated.

There is not a Persian version of the CPAQ (P-CPAQ) available in Iran. Therefore, the present study was designed to evaluate the psychometric properties of a Persian-language version of the CPAQ amongst Iranian chronic pain patients.

MATERIALS AND METHODS

Participants

The sample size on which factor structure, divergent and convergent validity and internal consistency of the P-CPAQ were tested was calculated according to the recommended 10:1 ratio of the number of participants to the number of scale items (Tabachnick & Fidell, 1996). Over a period of 7 months (from February to September 2010), data were collected from 245 participants with chronic pain attending pain clinics or similar facilities in public and private institutions in Tehran, Iran. Patients had to meet the following inclusion criteria: (1) willing to participate in the study; (2) having a history of persistent non-cancer pain for more than 6 months; (3) age over 18 and under 80 years; (4) not being affected by major mental disorders such as psychosis or dementia; and (5) able to read and speak Persian (Farsi). After consenting to the study, a battery of questionnaires was given to each participant by the first author (FM) who explained the purpose of the study and how to complete the measures. She also checked the measures for completion at the medical centres.

The test-retest reliability of the P-CPAQ was tested on a different sample of chronic pain patients ($n = 24$) referred to a physiotherapy centre for treatment. The method of sampling is as follows. The FM first called patients whose visits were scheduled for the next 21 days and asked if they met the inclusion criteria (as described in the preceding paragraph) of the study. If they met the criteria, packages including two hard copies of the P-CPAQ and a filling instruction guidance sheet were mailed to the patients. In those instructions, they were asked to fill in the two questionnaires separately with a separation time of 2 weeks (before the visit) and mail the questionnaires back to the FM. In this process, a total of 60 packages were mailed. However, only 24 of these 60 people returned their completely filled questionnaires to us. We did not perform any follow-up call.

In addition to the above two samples, 40 chronic pain patients who met the inclusion criteria of the study (as described above) were asked to participate in a pilot study and complete the first draft of the P-CPAQ. Data collected from these patients were not used for further analysis.

Measures

The Persian-Language Version of Chronic Pain Acceptance Questionnaire

Current guidelines for cross-cultural adaptation of measures generally recommend a multistep process, including forward and back translations and steps to ensure the conceptual equivalence of the measures (e.g., Gjersing, Caplehorn, & Clausen, 2010; Guillemin, Bombardier, & Beaton, 1993). In our translation of the CPAQ, we incorporated some of these recommendations as follows: (1) two bilingual mental health practitioners independently translated the original version of the CPAQ (McCracken *et al.*, 2004b) from English into Persian—differences were solved by agreement; (2) another two mental health practitioners who were fluent in Persian and English and had no knowledge regarding the questionnaire carried out back translations; and (3) pilot testing was performed on a sample of 40 chronic pain patients. These participants were asked to report any problems that they had in understanding the CPAQ items. On the basis of the results of this pilot study, some additional changes were made to the CPAQ (Two long sentences were changed into four shorter sentences and another long sentence was made more understandable by adding a comma). In addition, as Persian (Farsi) language is a right-to-left language (whereas English is a left-to-right language), in the P-CPAQ, each statement is written from right to left. Apart from the above, the P-CPAQ was very similar to the original version without compromising its comprehension and being adequate in the Persian (Farsi) language (see appendix A for a copy of P-CPAQ).

As in the original version of the CPAQ, the P-CPAQ consists of 20 items. The P-CPAQ has two subscales, namely activity engagement (AE) and pain willingness (PW). All items are rated on a 0 (never true) to 6 (always true) scales. Nine items measuring PW were reverse-keyed. In addition

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to the above two subscales, a single total score was calculated on the basis of the nine reverse-keyed items and the other 11 items measuring AE. The maximal possible total score is 120, with a higher score indicating better acceptance (McCracken *et al*., 2004b; Rodero *et al*., 2010).

Pain Self-Efficacy

Pain self-efficacy was assessed by the Persian version of the Pain Self-Efficacy Questionnaire (P-PSEQ) (Asghari & Nicholas, 2009). Like the original version of the Pain Self-Efficacy Questionnaire (Nicholas, 2007), the P-PSEQ asks patients to rate how confident they are that they can do each of the 10 activities or functions at present, despite their pain, by selecting a number on a seven-point scale, where 0 equals 'not at all confident' and 6 equals 'completely confident'. Scores on the P-PSEQ may range from 0 to 60, with higher scores indicating stronger self-efficacy beliefs. The psychometric properties (i.e., validity and reliability) of the P-PSEQ have been confirmed among Iranian samples (Asghari & Nicholas, 2009).

Catastrophizing

Catastrophizing was assessed by the Catastrophizing subscale of the Persian version of the Coping Strategies Questionnaire (P-CSQ) (Asghari & Golak, 2005). Like the original version of the Coping Strategies Questionnaire (CSQ) (Rosenstiel & Keefe, 1983), the Catastrophizing scale of the P-CSQ consists of six items, and the patient rates each item by indicating how often she/he uses that strategy to cope with pain by selecting a number on a seven-point scale. The score on the subscale of Catastrophizing can range from 0 to 36, with a higher score indicating more catastrophizing when experiencing pain. The subscale of catastrophizing has been shown to have good internal consistency (Chronbach's alpha = 0 .80) and construct validity (Asghari & Golak, 2005).

Depression and Anxiety

The Depression Anxiety and Stress Scale-21 (DASS-21) is a short form of the Depression Anxiety and Stress Scale-42 that was originally developed by Lovibond and Lovibond (1995) to assess depression, anxiety and stress. Seven items are allocated to each measure of depression, anxiety and stress. All items are rated on a 0–3 scale. Only the Depression and Anxiety subscales were used for this study, and scores are doubled so they are comparable with scores for the full 42-item version, which range between 0 and 42, with higher scores indicating more severe levels of depression and anxiety. The Persian version of the DASS-21 has been shown to be reliable with good construct validity (Asghari, Mehrabian, Paknejad, & Saied, 2010).

Pain Intensity and Pain-Related Interference

The Multidimensional Pain Inventory (MPI) was developed to assess various aspects of chronic pain and disability (Kerns, Turk, & Rudy, 1985). In the Persian version of MPI, the subscales of parts 1 and 2 have been translated to Persian and psychometrically tested. The discriminant and criterion validity of the scale were confirmed, and internal consistencies for the subscales were satisfactory (0.77–0.92) (Asghari & Golak, 2008). The subscales included in the present study were: pain intensity (three items) and pain-related interference (nine items). All items were rated on a 0–6 scale, with higher scores indicating more pain and interference.

Physical Disability

Physical disability was measured using the Persian version of the Roland and Morris Disability Questionnaire (P-RMDQ) (Asghari, 2011). Like the original version of the Roland and Morris Disability Questionnaire (Roland & Morris, 1983), the P-RMDQ has 24 items, and patients were asked to answer each item by using a yes-no format. Each endorsed item receives one score, and the total scores can range from 0 (no disability) to 24 (severe disability). Studies indicate reasonable reliability ($\alpha = 0.87$–0.88) and validity suggested by significant correlations with measures of pain intensity and depression (Asghari, 2011; Asghari, Julaeiha, & Godarsi, 2008).

Data Analysis

All data were collected, scored and entered into a secure database by the FM. Prior to the analyses, data were examined through the SPSS programme for accuracy of data entry, missing values, normal distributions and possible outliers (Tabachnick & Fidell, 1996).

In this study, data were analyzed in a number of ways:

A principal component analysis (PCA) was used to identify components of the P-CPAQ (Preacher & MacCallum, 2003). Eigenvalues and scree plot were used to determine the number of components underlying the P-CPAQ. Although these two methods are the most popular, they are potentially unreliable and may lead to 'overfactoring' (Ferguson & Cox, 1993; Tabachnick & Fidell, 1996; Zwick & Velicer, 1986). Parallel analysis (PA) (Horn, 1965) was employed to ascertain the optimal number of components to extract. PA requires the researcher to randomly generate a raw data matrix on the same 'rank' as the actual raw data matrix. For example, if one had a 1–4 Likert scale data for 200 subjects on 30 variables, a 200×30 raw data matrix consisting of 1, 2, 3 and 4 s would be generated. This random data can be factor analyzed to produce a set of eigenvalues. The eigenvalues associated with the matrix of association based on observed data are also computed. The number of extractable factors is equal to the number with observed eigenvalues greater than the point on the plot where the

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observed and random eigenvalues cross (Ferguson & Cox, 1993; Horn, 1965; Thompson & Daniel, 1996).

The adequacy of the component structure of the P-CPAQ obtained from PA was tested in the sample via structural equation modelling (SEM) with the AMOS software package (v.6) (Amos Development Corporation Spring House, PA, USA). Given that the interpretation of model fit in SEM is not without some degree of controversy, several indices of fit were used, and evaluation was based on convergence among findings. The root mean square error of approximation (RMSEA) with 90% confidence interval was evaluated. The RMSEA expresses fit per degree of freedom of the model and should be <0.08 for acceptable fit, with 0.05 or lower indicating a very good fitting model (Browne & Cudeck, 1993).The goodness of fit index and adjusted goodness of fit index, which adjust for the number of parameters estimated, range from 0 to 1 with values of 0.90 or greater indicating a good fitting model. The comparative fit index assesses fit relative to a null model by using non-centrality parameters (Bentler, 1988) (adequate fit > 0.90).The standardized root mean square residual (RMR) is the average of the differences between the sample correlations and the estimated population correlations. The RMR has a range from 0 to 1; values of 0.08 or less are desired (Hu & Bentler, 1999). Finally, the normal Chi-square (Chi-square divided by degree of freedom) should be less than 3 for an acceptable model (Mulaik *et al.*, 1989).

Convergent and divergent validity of the P-CPAQ were examined, using Pearson product-moment correlations between the P-CPAQ scores and a series of interested variables. Finally, reliability of P-CPAQ and its two components was determined by examining both the internal consistency and test-retest stability of the P-CPAQ and its two components (Nunnally & Bernstein, 1994).

All statistical analyses were conducted with the use of the Statistical Package for Social Science (SPSS Inc., Chicago, IL, USA) version 17.0 for windows.

RESULTS

Sample Characteristics

The sample's mean age was 43.8 (standard deviation [SD] = 13) years, with the majority being women (72.8%) and most were married (76%). The participants predominantly (79.6%) had at least a high school certificate (i.e., 12 years of formal education) and 44% were homemakers. On average, the patients had suffered from chronic pain for 5.8 years ($r = 0.5$–45 years; SD = 8 years). The most frequently identified pain sites were legs/arms (38%), followed by low back (31.5%), shoulder (12%), neck (9%), pelvic region (5%), head (3%) and other (e.g., chest, abdominal; 1.5%).

Principal Component Analysis

PCA was used to identify dimensions of the P-CPAQ. Results from the Kaiser–Meyer–Olkin's (coefficient = 0.86) and the Bartlett's tests ($\chi^2 = 1516.745$, $p \leq 0.0001$) indicated that data from 245 participants were suitable for performing factorial analyses. The decision between orthogonal and oblique rotation was made by examining the correlations among factors (Tabachnick & Fidell, 1996). Since none of the correlations was greater than 0.32, (the greatest correlation was 0.21 between factors 1 and 3) the resulting factors were subjected to varimax rotation (Tabachnick & Fidell, 1996).

Eigenvalues of the first four components were 5.34, 2.77, 1.40 and 1.04, and the others were less than 1, so a four-factor solution may be appropriate. The examination of the scree plot also suggested that four dimensions underlie the P-CPAQ. As mentioned before (i.e., Section on data analysis) in this study, PA (Horn, 1965) was employed to ascertain the optimal number of factors to extract. By using the procedure recommended by Patil, Singh, Mishra, and Donavan (2008), 100 random data sets were generated of the same order of the P-CPAQ data. Only the first two eigenvalues of the P-CPAQ components exceeded their associated eigenvalues derived from the random data, and a two-factor model was appropriate (see Table 1).

Table 1 shows the factor loadings, communalities (h^2), eigenvalues and percentage of variance for the two-factor solution. This model accounted for 40.5% of the variance in P-CPAQ item scores. Factors 1 and 2 were equivalent to those reported by McCracken and colleagues (2004b): AE and PW, respectively.

Confirmatory Factor Analysis

Confirmatory factor analysis was performed on the covariance matrix of the P-CPAQ items. The model parameters were estimated using maximum likelihood. Considering the content of the P-CPAQ items, in this model, items 1, 2, 3, 5, 6, 8, 9, 10, 12, 15 and 19 were loaded on factor 1 (AE), and items 4, 7, 11, 13, 14, 16, 17, 18 and 20 were loaded on factor 2 (PW).

The results are presented in Table 2. Inspection of the P-CPAQ's items suggested that some of the items have more similar content than others. For example, item 3, 'It's OK to experience pain' and item 5, 'It's not necessary for me to control my pain in order to handle my life well'. Based on the inspection of modification indices produced by the statistical package, specific error covariance terms were freed sequentially. That is, after freeing error covariance between specific items, the fit indices were examined to see if they improved.

As can be seen in Table 2, freeing four of the error covariance terms between items significantly improved

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Table 1. Factor loadings and communalities (h^2) of the Persian version of the Chronic Pain Acceptance Questionnaire items as obtained by means of principal component analysis for the two-factor solution

Items	F1	F2	h^2
Activity engagement			
2	0.81	0.08	0.66
8	0.79	0.11	0.63
1	0.73	−0.01	0.53
15	0.69	0.15	0.50
9	0.68	−0.04	0.46
6	0.62	0.10	0.39
10	0.60	0.08	0.36
12	0.58	0.16	0.37
3	0.48	0.12	0.24
5	0.47	0.02	0.22
19	0.42	0.01	0.17
Pain willingness			
14	0.27	0.75	0.63
13	0.35	0.68	0.58
7	0.03	0.65	0.42
11	0.05	0.62	0.38
18	0.03	0.59	0.35
16	−0.11	0.57	0.33
17	0.17	0.56	0.34
4	0.15	0.52	0.29
20	−0.06	0.47	0.22
Eigenvalues	5.34	2.77	
Percentage variance	26.69	13.68	

F1 = factor 1. F2 = factor 2.

the fit of the model. By sequentially incorporating error covariance terms into the model, a consistent fit to the data was achieved. Given these results, we decided to retain the two-factor model as it has the best overall fit.

Table 3 presents the mean, SD and the observed range of scores for the study variables.

Convergent and Divergent Validity of the Persian version of the Chronic Pain Acceptance Questionnaire Scale and its Two Subscales (activity engagement and pain willingness)

Considering the results of previous studies, significant relationships between the P-CPAQ scores and measures of physical disability, mood, catastrophizing, self-efficacy, pain intensity and pain-related interference are predictable. It would be expected that the P-CPAQ scores would correlate moderately and positively with the scores on the PSEQ (as higher pain acceptance indicates higher self-efficacy) (Nicholas & Asghari, 2006). Similarly, it would be expected that the P-CPAQ scores would be correlated significantly but negatively with the other measures.

To examine convergent and divergent validity of the P-CPAQ and its two subscales, Pearson product-moment correlations between the study variables were determined (see Table 4). As expected, total P-CPAQ scores and its two subscales were significantly correlated with the mentioned variables. As can be seen in Table 4, higher scores on the AE and the PW subscales were significantly associated with lower pain intensity, depression, anxiety, physical disability, catastrophizing and pain-related interferences. Higher acceptance scores were also associated with higher self-efficacy scores.

Reliability

Reliability was determined by examining both the internal consistency and test-retest stability of the P-CPAQ factors.

Internal Consistency

The internal consistencies for the PW subscale ($\alpha = 0.85$) and for total scale ($\alpha = 0.84$) were good, and for the AE subscale ($\alpha = 0.79$), the internal consistency was acceptable (Nunnally & Bernstein, 1994).

Test-Retest Reliability

This was tested on a different sample of chronic pain patients ($n = 24$) referred to a physiotherapy centre for treatment. These patients were tested two times at an interval of 2 weeks before receiving treatment. Pearson product-moment correlations were calculated between time 1 and time 2 assessments for the two components and total scale of the P-CPAQ. These correlations were as follows: for AE ($r = 0.72$), for total P-CPAQ ($r = 0.71$) and for PW ($r = 0.93$) all were statistically significant ($p < 0.001$).

Table 2. Summary of the model fit indexes (two-factor solution)

Model	Free parameters	RMR	RMSEA (90% confidence interval)	CFI	GFI	AGFI	χ^2	df	χ^2/df
1	None	0.067	0.059 (0.049–0.069)	0.89	0.88	0.85	314.28	169	1.86
2	Error covariance 3 and 5 = free	0.066	0.057 (0.047–0.068)	0.90	0.90	0.89	302.32	168	1.80
3	More than above, error covariance 1 and 9 = free	0.066	0.055 (0.044–0.065)	0.91	0.91	0.89	189.49	167	1.73
4	More than above, error covariance 2 and 8 = free	0.065	0.051 (0.040–0.062)	0.92	0.92	0.90	272.58	164	1.64
5	More than above, error covariance 18 and 20 = free	0.064	0.049 (0.038–0.060)	0.92	0.92	0.90	262.60	165	1.59

RMR = root mean square residual. RMSEA = root mean square error of approximation. CFI = comparative fit index. GFI = goodness of fit index. AGFI = adjusted goodness of fit index. df = degrees of freedom.

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Table 3. Mean, standard deviation (SD) and range of scores for the study variables ($n = 245$)

Instrument	Mean	SD	Observed range
Pain intensity (0–6)	4.1	1.18	1–6
Depression[a] (0–42)	10.4	8.4	0–36
Anxiety[a] (0–42)	6.6	8.8	0–42
Pain-related interference (0–6)	3.3	1.4	0–6
Physical disability (0–24)	12.0	5.6	1–24
Pain catastrophizing (0–36)	12.8	8.8	0–34
Pain self-efficacy (0–60)	39.9	12.3	7–59
Activity engagement (0–66)	42.0	12.5	3–66
Pain willingness (0–54)	21.4	10.3	0–52
Pain acceptance (0–120)	63.5	18.2	5–118

[a]To provide an opportunity to compare the finding of this study with Depression Anxiety and Stress Scale-42, scores of depression and anxiety were multiplied by 2 (Henry & Crawford, 2005).

Table 4. Correlations between total Persian version of the Chronic Pain Acceptance Questionnaire (P-CPAQ) and its two subscales with study variables

Variables	Activity engagement	Pain willingness	Total P-CPAQ
Pain intensity	−0.21**	−0.17**	−0.24**
Pain-related interference	−0.44**	−0.55**	−0.61**
Depression	−0.23**	−0.17**	−0.25**
Anxiety	−0.20**	−0.15*	−0.22**
Pain catastrophizing	−0.26**	−0.32**	−0.35**
Physical disability	−0.24**	−0.38**	−0.38**
Pain self-efficacy	0.65**	0.35**	0.64**

*$p < 0.05$.
**$p < 0.01$.

Relationships between Pain Acceptance and Gender, Age and Pain Duration

Men and women did not significantly differ in P-CPAQ total scores (M = 66.10, SD = 19.23 for men; and M = 62.43, SD = 17.77 for women; $t = 1.41$, $p > 0.05$). Likewise, no significant difference was found between men and women on the PW (M = 23.04, SD = 11.55 for men, and M = 20.77, SD = 9.75 for women; $t = 1.55$, $p > 0.05$) or the AE (M = 43.05, SD = 11.24 for men, and M = 41.66, SD = 12.94 for women; $t = 0.78$, $p > 0.05$) subscales. P-CPAQ scores and its two subscales did not significantly correlate either with age ($r = 0.04$, $p > 0.05$ for the AE subscale; $r = 0.02$, $p > 0.05$ for the PW; $r = 0.04$, $p > 0.05$ for the total score) or with duration of pain ($r = 0.02$, $p > 0.05$ for the AE; $r = 0.05$, $p > 0.05$ for the PW; $r = 0.04$, $p > 0.05$ for the total score).

DISCUSSION

The present study describes the psychometric properties of the P-CPAQ amongst Iranian chronic pain patients. PCA with varimax rotation revealed four components with eigenvalues greater than 1. The scree plot confirmed the four-factor construct as well. This is similar to the study conducted by Nicholas and Asghari (2006). In fact, in their study, eigenvalues greater than 1 were used as the main criterion for retaining factors that lead to overestimation of the number of factors. Here, however, we used PA to overcome this drawback. PA indicated that the P-CPAQ, similar to its other translated versions, i.e., Chinese, Spanish, Swedish, Italian and German, has a two-factor construct, AE and PW. Except for the Swedish version in which item 16 was excluded, in all translated versions of CPAQ, the two factors include the same items as the original English one.

In our study, additionally, the confirmatory factor analysis indicated that the two-factor model adequately fits to the data. The two factors explained a satisfactory percentage of total variance (40.55%). Test-retest reliability and internal consistency supported the reliability of the P-CPAQ. The P-CPAQ validity was reflected in significant correlations (in expected directions) between the P-CPAQ scores and measures of disability, depression, anxiety, catastrophizing, pain intensity, pain-related interference and pain self-efficacy.

Amongst demographic characteristics, duration of pain attracted more attention than the others (Rodero *et al.*, 2010). Although two recent studies showed positive correlations between the CPAQ and the duration of pain (Ning *et al.*, 2008; Wicksell, Melin & Olsson, 2009), in the present study, similar to the majority of studies (e.g., Bernini *et al.*, 2010; McCracken *et al.*, 2004b; Richardson *et al.*, 2010; Rodero *et al.*, 2010), correlation between pain acceptance and the duration of pain was not significant, indicating that acceptance is not a product of pain duration. The relation between pain intensity and pain acceptance was weak ($r = -0.24$). This demonstrates that although pain intensity is reflected in pain acceptance (in an inverse relationship) to some extent, other factors contribute to pain acceptance as well, as argued originally by McCracken *et al.* (2004b). Results of the present study also are in accordance with previous ones (Bernini *et al.*, 2010; McCracken *et al.*, 2004b; McCracken & Vowles, 2008; Nicholas & Asghari, 2006; Ning *et al.*, 2008; Rodero *et al.*, 2010), indicating that the total scale is independent of gender. Our finding regarding the relationship between age and P-CPAQ scores showed that acceptance is independent of age. Whereas many other studies also showed this lack of relationship, few researchers (Nicholas & Asghari, 2006) reported a significant correlation. Further research aimed at exploring whether cultural differences account for these discrepancies is needed.

Similar to reports of Ning *et al.* (2008) and Nicholas and Asghari (2006), in our study, we found that the more chronic pain acceptance, the more self-efficacy. Among correlation coefficients, the correlation between self-efficacy and AE was found to be higher than the others. Theoretically, McCracken *et al.* (2004b) defined AE as 'the pursuit of life activities in a normal manner even while pain is being

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experienced' (p. 164), and Nicholas (2007) described self-efficacy as reflecting a belief in one's ability to engage in normal activities despite pain. So these two concepts (AE and self-efficacy) seem to be similar in some extent. Consequently, moderate correlation between questionnaires assessing them is expected.

In this study, it is shown that PW and AE have weak and negative correlations with the anxiety and depression. Whereas the majority of previous studies reported stronger correlations between them, there are two studies that report non-significant correlations (Ning *et al.*, 2008; Rodero *et al.*, 2010). This heterogeneity in results may be due to cultural differences and/or differences in instruments used for assessment of anxiety and depression. This study is the first to use the CPAQ in a Muslim population, and the religion may be a confounding factor in explaining the relationship between acceptance and anxiety or depression. Comparing Iranian subjects' mean score with the P-CPAQ with those of the other versions shows that the mean score of the P-CPAQ in the Iranian sample is the highest. Perhaps one of the reasons is the differences in the health system in Iran compared with those in western countries in which chronic pain patients have the benefit of health insurance and compensation. Unlike most western countries (in Europe and North America), Iran does not have a universal workers compensation insurance system or disability support system. Thus, an injured worker in Iran who has persisting pain will usually have to return to work or rely upon their family to survive economically. Thus, Iranians are generally expected to perform daily activities of life whether or not they have persisting pain. In western countries, this may not be the case. This is relevant to the construct of pain acceptance, as measured by the CPAQ. The economic imperative for many Iranian pain patients is that they are faced with either functioning despite pain or suffering greater hardship. It might therefore be expected that the level of pain acceptance of Iranian pain patients would tend to be higher relative to those from more economically advanced western countries.

Besides, a large number of our sample was homemaker women who because of cultural issues and family responsibilities had to continue household activities despite pain. Of course, more studies are necessary to explain the differences.

Some limitations of the present study should be noted. The participants in the present study were not selected at random from the population. Thus, the findings may not be representative of all the patients with chronic pain, and the generalizability of the results to all Iranian chronic pain patients cannot be assumed. As mentioned above, our study is cross-sectional, so directions of causality between variables cannot be inferred. Another limitation corresponds to self-report measurements used in this work. Whereas in some variables (e.g., pain intensity), it is needed to use self-report questionnaires, in others, such as AE, it would be profitable to include behavioural measures. Heterogeneity of the sample in this study concerning clinical diagnoses and pain sites might differently interfere with daily life activities and functioning. Therefore, results from this research might be biased by the heterogeneity of the sample. Future researches should study whether the relations between the CPAQ dimensions and outcome measures remain in homogeneous samples.

Despite these limitations, the present study's strengths mean that the findings obtained should be of value to those interested in using the P-CPAQ in clinical and research settings in Iran. These strengths include the use of widely recognized methods for translating CPAQ from English into Farsi, the adequate size of the sample studied for the analyses conducted, the employment of other well-validated and established scales for comparison, as well as the consistency in findings with other translated versions of the CPAQ for other countries.

To conclude, the results obtained with the P-CPAQ provide support for the psychometric properties of the P-CPAQ among Iranian chronic pain population.

REFERENCES

Asghari, A. (2005). The prevalence of persistent and recurrent chronic pain and its effects on social functioning and lives of an industrial unit's staffs in Tehran (in Persian). *Daneshvar Raftar*, *4*, 1–14.

Asghari, A. (2011). Psychometric properties of a modified version of the Roland–Morris disability questionnaire (M-RMDQ). *Archives of Iranian Medicine*, *14*(5), 327–331.

Asghari, A., & Golak, N. (2005). Role of coping strategies in adjustment to chronic pain (in Persian). *Daneshvar Raftar*, *10*, 1–23.

Asghari, A., & Golak, N. (2008). Psychometric properties of multidimensional pain inventory amongst Iranian chronic pain patients (in Persian). *Psychology*, *45*, 50–72.

Asghari, A., & Nicholas, M. (2009). An Investigation of pain self-efficacy beliefs in Iranian chronic pain patients: A preliminary validation of a translated English-language scale. *Pain*, *10*, 619–632. DOI:10.1111/j.1526-4637.2009.00623

Asghari, A., Julaeiha, S., & Godarsi, M. (2008). Disability and depression in patients with chronic pain: Pain or pain- related beliefs? *Archives of Iranian Medicine*, *11*(3), 263–269.

Asghari, A., Mehrabian, N., Paknejad, M., & Saied, F. (2010). Psychometric properties of depression anxiety and stress scale amongst chronic pain patients (in Persian). *Psychology and Education journal of Tehran University*, *1*, 13–42.

Bentler, P.M. (1988). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238–246.

Bernini, O., Pennato, T., Cosci, F., & Berrocal, C. (2010). The psychometric properties of the chronic pain acceptance questionnaire in Italian patients with chronic pain. *Health Psychology*, *2*, 1–10. DOI: 10.1177/1359105310365576

Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen, & J.S. Long (Eds). *Testing structural equation models* (pp. 62–136). Newbury Park: Sage Publications.

Ferguson, E., & Cox, T. (1993). Exploratory factor analysis a users' guide. *International Journal of Selection and Assessment*, *1*, 84–94.

DOI: 10.1002/cpp

Forman, E.M., Herbert, J.D., Moitra, E., Yeomans, P.D., & Geler, P.A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification*, *10*, 1–28.

Gatchel, R.J., & Dersh, J. (2002). Psychological disorders and chronic pain: Are there cause-and-effect relationships? In D.C. Turk, and R.J. Gatchel (Eds), *Psychological approaches to pain management: a practitioner's handbook* (pp. 30–52). New York: Guilford Press.

Ghaffari, M., Alipour, A., Jensen, I., Farshad, A.A., & Vingard, E. (2006). Low back pain among Iranian industrial workers. *Occupational Medicine*, *56*, 455–460.

Gheldof, E.L.M., Jong, J.D., Vinck, J., & Houben, R.M.A. (2004). Attitudes toward physical activity: The role of implicit versus explicit associations. In G.J.G. Asmundson, J.W.S. Vlaeyen, G. Crombez (Eds), *Understanding and treating fear of pain* (pp. 117–139). New York: Oxford University press.

Gjersing, L., Caplehorn, J.R.M., & Clausen, T. (2010). Cross-cultural adaptation of research instruments: Language, setting, time and statistical considerations. *Medical Research Methodology*, *10*, 13.

Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Clinical Epidemiology*, *46*, 1417–1432.

Hayes, S.C., & Duckworth, M.P. (2006). Acceptance and commitment therapy and traditional cognitive behaviour therapy approaches to pain. *Cognitive and behavioural practice*, *13*, 185–187.

Henry, J.D., & Crawford, J.R. (2005). The short form of the depression anxiety stress scales (DASS-21): Construction validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, *44*, 227–239.

Horn, J.L. (1965). A rational and test for the number of factors in factor analysis. *Psychometrika*, *30*, 179–185.

Hu, L.T., & Bentler, P.M. (1999). Cut-off criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling*, *6*, 1–55.

Kerns, R.D., Turk, D.C., Rudy, T.E. (1985). The West Haven-Yale Multidimensional Pain inventory (WHYMPI). *Pain*, *23*, 345–356.

Lovibond, P.F., & Lovibond, S.H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the beck depression and anxiety inventories. *Behavioural Research Therapy*, *33*, 335–343.

McCracken, L.M. (1998). Learning to live with the pain: Acceptance of pain predicts adjustment in persons with chronic pain. *Pain*, *74*, 21–27. PII S0304-3959(97)00146-2

McCracken, L.M., & Samuel, V.M. (2007). The role of avoidance, pacing and other activity patterns in chronic pain. *Pain*, *130*, 119–125. DOI:10.1016/j.pain.2006.11.016

McCracken, L.M., & Vowles, K.E. (2006). Acceptance of chronic pain. *Current Pain and Headache Reports*, *10*, 90–94.

McCracken, L.M., Carson, J.W., Eccleston, C., & Keefe, F. (2004a). Acceptance and change in the context of chronic pain. *Pain*, *109*, 4–7. DOI:10.1016/j.pain.2004.02.006

McCracken, L.M., Vowles, K.E., & Eccleston, C. (2004b). Acceptance of chronic pain: Component analysis and a revised assessment method. *Pain*, *107*, 159–166. DOI:10.1016/j.pain.2003.10.012

Mulaik, S.A., James, L.R., Van Alstine, J., Bennett, N., Lind, S., Stilwell, C.D. (1989). Evaluation of goodness of fit indices for structural equation models. *Psychological Bulletin*, *105*, 430–445.

Nicholas, M.K. (2007). The pain self-efficacy questionnaire: Taking pain into account. *European Journal of Pain*, *11*, 153–16.

Nicholas, M.K., & Asghari, A. (2006). Investigating acceptance in adjustment to chronic pain: Is acceptance broader than we thought? *Pain*, *124*, 269–279. DOI:10.1016/j.pain.2006.04.032

Nilges, P., Köster, B., & Schmidt, C.O. (2007). Pain acceptance—concept and validation of a German version of the chronic pain acceptance questionnaire. *Schmerz*, *21*, 57–67. English abstract, DOI:10.1007/s00482-006-0508-1

Ning, M.C., Chiming, T.W., Mae, Y.C., & Ping, C.P. (2008).Validation of Chronic Acceptance Questionnaire (CPAQ) in Cantonese-speaking Chinese patients. *Pain*, *9*, 823–832. DOI:10.1016/j.jpain.2008.04.005

Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory*. New York: McGraw Hill.

Patil, V.H., Singh, S.N., Mishra, S., & Donavan, D.T. (2008). Efficient theory development and factor retention criteria: Abandon the 'eigenvalue greater than one' criterion. *Journal of Business Research*, *61*, 162–170.

Preacher, K.J., & MacCallum, R.C. (2003). Repairing Tom Swift's electric factor analysis machine. *Understanding Statistics*, *2* (1), 13–43.

Reneman, M.F., Dijkstra, A., Geertzen, J.H., & Dijkstra, P.U. (2009). Psychometric properties of chronic pain acceptance questionnaires: A systematic review. *European Journal of Pain*, DOI:10.1016/ j.ejpain.08.003

Richardson, E.J., Ness, T.J., Doleys, D.M., Bannos, J.H., Cianfrini, L., Richards, J.S. (2010). Catastrophising, acceptance, and interference: laboratory findings, subjective report, and pain willingness as a moderator. *Health Psychology*, *3*, 299–306. DOI:10.1016/j.pain.2009.08.030

Rodero, B., Campayo, J.G., Casanueva, B., Lopez del Hoyo, Y., Blanco, A.S., & Luciano, J.V. (2010). Validation of the Spanish version of the Chronic Pain Acceptance Questionnaire (CPAQ) for the assessment of acceptance in fibromyalgia. *Health and Quality of Life Outcomes*, *8*, 37. DOI: 10.1186/1477-7525-8-37

Roland, M., & Morris, S. (1983). A study of the natural history of back pain. Part I: Development of a reliable and sensitive measure of disability in low-back pain. *Spine*, *8*, 141–144.

Rosenstiel, A.K., & Keefe, F.J. (1983). The use of coping strategies in chronic low back pain patients: Relationship to pain characteristics and current adjustment. *Pain*, *17*, 33–44.

Tabachnick, B.G., & Fidell, L.S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.

Thompson, B., & Daniel, L.G. (1996). Factor analytic evidence for the construct validity of scores: A historical overview and some guidelines. *Educational and Psychological Measurement*, *56*, 197–208.

Turk, D.C., & Melzack, R. (2001). The measurement of pain and the assessment of people experiencing pain. In D.C. Turk and R. Melzack (Eds). *Handbook of pain assessment, 2th edition* (pp. 3–15). New York: Guilford Press.

Turk, D.C., & Monarch, E.S. (2002). Biopsychosocial perspective on chronic pain. In D.C. Turk, & R.J. Gatchel (Eds). *Psychological approaches to pain, 2th edition* (pp. 3–30). New York: Guilford Press.

Turk, D.C., Dworkin, R.H., Burke, L.B., Gershon, R., Rothman, M., Scott, J., Allen, R.A., Atkinson, J.H., Chandler, J., Cleeland, C., Cowan, P., Dimitrova, R., Dionne, R., Farrar, J.T., Haythornthwaite, J.A., Hertz, S., Jadad, A.R., Jensen, M.P., Kellstein, D., Kerns, R.D., Manning, D.C., Martin, S., Max, M.B., McDermott, M.P., McGrath, P., Moulin, D.E., Nurmikko, T., Quessy, S., Raja, S., Rappaport, B.A., Rauschkolb, C., Robinson, J.P., Royal, M.A., Simon, L., Stauffer, J.W., Stucki, G., Tollett, J., von Stein, T., Wallace, M.S., Wernicke, J., White, R.E., Williams, A.C., Witter, J., Wyrwich, K.W. (2006). Developing patient-reported outcome measures for pain clinical trials: IMMPACT recommendations. *Pain*, *125*, 208–215.

DOI: 10.1002/cpp

Viane, I., Crombez, G., Eccleston, C., Poppe, C., Devulder, J., DeCorte, W. (2004). Acceptance of the unpleasant reality of chronic pain: Effects upon attention to pain and engagement in daily activities. *Pain*, *112*, 282–288. DOI:10.1016/j.pain.2004.09.008

Wicksell, R.K., Melin, L., Olsson, G.L. (2007). Exposure and acceptance in the rehabilitation of adolescents with idiopathic chronic pain. *European Journal of Pain*, *11*, 267–274. DOI: 10.1016/ j.ejpain.2006.02.012

Wicksell, R.K., Melin, L., Olsson, G.L. (2009). The Chronic Pain Acceptance Questionnaire (CPAQ)—further validation including a confirmatory factor analysis and a comparison with the Tampa Scale of Kinesiophobia. *European Journal of Pain*, *13*, 760–768. DOI:10.1016/ j.ejpain. 2008. 09. 003

Zwick, W.R., & Velicer, W.F. (1986). A comparison of five rules for determining the number of components to retain. *Psychological Bulletin*, *99*, 432–442.

APPENDIX A

The Persian version of the chronic pain acceptance questionnaire (P-CPAQ)

نسخه فارسی پرسشنامه پذیرش درد مزمن

لطفا عبارات زیر را به دقت مطالعه نمایید و میزان درستی هریک از آنها را در مورد خودتان، درجه‌بندی کنید. برای درجه‌بندی هر عبارت از مقیاس زیر استفاده کنید.

۰= عبارت مذکور **اصلا** در مورد شما صادق نیست، **۱** = عبارت مذکور **خیلی به ندرت** در مورد شما صادق است، **۲** = عبارت مذکور **به ندرت** در مورد شما صادق است، **۳** = عبارت مذکور **گاهی** در مورد شما صادق است، **۴** = عبارت مذکور **غالبا** در مورد شما صادق است، **۵** = عبارت مذکور **تقریبا همیشه** در مورد شما صادق است و **۶** = عبارت مذکور **همیشه** در مورد شما صادق است. به عنوان مثال، اگر فکر می‌کنید عبارتی همیشه در مورد شما صادق است، در جلوی عبارت، دور عدد ۶ خط بکشید.

عبارت	**اصلا** در مورد شما صادق نیست	**خیلی به ندرت** در مورد شما صادق است	**به ندرت** در مورد شما صادق است	**گاهی** در مورد شما صادق است	**غالبا** در مورد شما صادق است	**تقریبا همیشه** در مورد شما صادق است	**همیشه** در مورد شما صادق است
۱- بدون توجه به شدت دردم، کارهایم را انجام می‌دهم.	۰	۱	۲	۳	۴	۵	۶
۲- با وجود درد مزمن، زندگیم را خوب اداره می‌کنم.	۰	۱	۲	۳	۴	۵	۶
۳- داشتن درد برایم مهم نیست.	۰	۱	۲	۳	۴	۵	۶
۴- با میل و رغبت، چیزهای مهمی را در زندگیم فدا می‌کنم تا بتوانم دردم را بهتر کنترل کنم.	۰	۱	۲	۳	۴	۵	۶
۵- برای اینکه بتوانم زندگیم را به نحو مطلوبی اداره کنم، لزومی ندارد دردم را کنترل کنم.	۰	۱	۲	۳	۴	۵	۶
۶- اگرچه چیزهایی تغییر کرده است، اما علیرغم وجود درد مزمن به طور معمول زندگی می‌کنم.	۰	۱	۲	۳	۴	۵	۶
۷- تمام تلاشم را باید برای خلاص شدن از درد به کار گیرم.	۰	۱	۲	۳	۴	۵	۶
۸- با وجود درد، فعالیت‌های زیادی را انجام می‌دهم.	۰	۱	۲	۳	۴	۵	۶
۹- علیرغم داشتن درد مزمن، زندگی پرباری دارم.	۰	۱	۲	۳	۴	۵	۶
۱۰- کنترل درد از هر هدف دیگری در زندگیم کم‌اهمیت‌تر است.	۰	۱	۲	۳	۴	۵	۶
۱۱- قبل از اینکه بتوانم گام‌های مهمی در زندگیم بردارم، باید افکار و احساساتم راجع به درد تغییر کنند.	۰	۱	۲	۳	۴	۵	۶
۱۲- علیرغم وجود درد، در حال حاضر فعالیت‌های مشخصی را در زندگیم انجام می‌دهم.	۰	۱	۲	۳	۴	۵	۶
۱۳- در انجام هرکاری، کنترل درد برایم اولویت نخست به شمار می آید.	۰	۱	۲	۳	۴	۵	۶
۱۴- قبل از آنکه بتوانم هرگونه تصمیم جدی بگیرم، باید تا حدی بر دردم کنترل داشته باشم.	۰	۱	۲	۳	۴	۵	۶
۱۵- حتی وقتی دردم شدید می‌شود، هنوز می‌توانم مسئولیت‌هایم را انجام دهم.	۰	۱	۲	۳	۴	۵	۶
۱۶- اگر بتوانم افکار منفی مربوط به دردم را کنترل کنم، بهتر می توانم از عهده زندگیم برآیم.	۰	۱	۲	۳	۴	۵	۶
۱۷- از قرار گرفتن در موقعیت‌هایی که ممکن است دردم را بیشتر کند، خودداری می‌کنم.	۰	۱	۲	۳	۴	۵	۶
۱۸- نگرانی‌ها و ترس‌هایم در مورد پیامدهای دردم، درست است.	۰	۱	۲	۳	۴	۵	۶
۱۹- اینکه بدانم به منظور ادامه زندگیم لازم نیست تغییری در دردم بوجود آورم، به من آرامش می‌دهد.	۰	۱	۲	۳	۴	۵	۶
۲۰- وقتی درد دارم، برای انجام کارها نیاز به تلاش بیشتری دارم.	۰	۱	۲	۳	۴	۵	۶

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