

Research papers

Validation of the Chronic Pain Acceptance Questionnaire (CPAQ) in an Internet sample and development and preliminary validation of the CPAQ-8

Rosemary A. Fish^{a,*}, Brian McGuire^a, Michael Hogan^a, Todd G. Morrison^b, Ian Stewart^a

^aSchool of Psychology and Centre for Pain Research, National University of Ireland, Galway, Ireland

^bDepartment of Psychology, University of Saskatchewan, Canada

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ABSTRACT

This study investigated the psychometric properties of the Chronic Pain Acceptance Questionnaire (CPAQ) in a mixed chronic pain, Internet sample and sought to develop a valid and reliable short form. Questionnaires were completed by 428 respondents, comprising a sample accessed via the Internet ($n = 319$) and a sample who completed a paper and pencil version of the measures ($n = 109$). Using confirmatory factor analysis (CFA) the two-factor structure of the CPAQ in the Internet sample was supported, though a good model fit was only achieved following the removal of one item. The resultant 19 item CPAQ demonstrated good reliability and evidence of validity was obtained for this sample. Data from the Internet sample were used to derive an eight-item short form. The two four-item factors (activity engagement [AE] and pain willingness [PW]) were confirmed using CFA and found to be invariant across both samples with good scale reliability. Higher CPAQ-8 and subscale scores were correlated with less depression and anxiety, pain severity and pain interference, and fewer medical visits for pain. Using structural equation modelling both subscales were found to partially mediate the impact of pain severity on pain interference and emotional distress. In this model AE had stronger associations with outcomes while PW accounted for a small portion of the variance in pain interference and anxiety, but not depression. This study confirmed the two-factor structure of the CPAQ in a mixed chronic pain Internet sample and provides preliminary evidence for the psychometric soundness of the CPAQ-8.

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1. Introduction

The experience of chronic pain can be associated with widespread suffering and limitations in physical, emotional, social and occupational functioning [4]. Research suggests that these sequelae can be ameliorated by a degree of pain acceptance which is associated with better functioning in cross-sectional and prospective studies [24,25,27,28] and significant improvements in outcomes following the application of acceptance-based programmes in an interdisciplinary pain management setting [29,33,46].

Chronic pain acceptance, from a contextual perspective, involves experiencing ongoing pain without attempts to avoid, reduce, or otherwise control it [26,32]. Two related behavioural processes have been identified including engaging in everyday activities of value to the individual in the presence of pain, and disengaging from the struggle to limit contact with pain [48]. The Chronic Pain Acceptance Questionnaire (CPAQ) was originally developed by Geisser in an unpublished doctoral dissertation and subsequently revised by McCracken, Vowles and Eccleston [32] who accordingly recommended a 20-item version with two

subscales: (a) the degree to which one engages in life activities regardless of pain (activity engagement, 11 items), and (b) willingness to experience pain, which is the inverse of engaging in behaviours to limit contact with pain (pain willingness, 9 items). These subscales have demonstrated good reliability and validity. In particular, recent confirmatory factor analyses in two separate studies have confirmed the fit and utility of a two-factor structure [48,49].

With increased attention to contextual cognitive behavioural therapeutic (CCBT) approaches and growing evidence for the relevance of pain acceptance and its relationship with important chronic pain outcomes [17,22,24,28,46], the utility of the CPAQ in current research is clear. However, two gaps in the literature are evident. First, it is recommended that chronic pain research not be limited to treatment seeking or pain clinic samples [45]. There also is growing interest in Internet-based interventions and research (e.g., [8,13,23,43]) and a need to validate measures for use in this context [6,7]. Second, response burden for the research participant or patient, especially in multivariate studies, and time restrictions in busy clinical encounters are limitations of longer questionnaires such as the full CPAQ. While 20 items do not constitute an excessively long scale, impetus for a short form comes from a number of sources [22,49] as well as research which recommends the use of suitable short versions where possible to improve response rates for postal questionnaires in health settings and research [15,36]. Therefore, the aims of the

* Corresponding author. Tel.: +353 91 493264.

E-mail address: rosemaryfish@gmail.com (R.A. Fish).

present study were to: (1) validate the CPAQ in an Internet-based, mixed chronic pain sample using confirmatory factor analysis (CFA); and (2) develop and validate a short-form of the CPAQ in order to reduce response burden for participants in research and clinical settings where a collection of measures may be required. If supported statistically, an eight-item version was considered to be a reasonable target length, as it is short enough to make the administration of the measure more efficient, but long enough to permit retention of two meaningful factors which can be assessed using confirmatory factor analysis [37].

2. Methods

2.1. Procedure

The study was approved by two research ethics committees affiliated with a university and a hospital in Western Ireland and, thus, adhered to general ethical standards for research using human subjects. Inclusion criteria were that participants be over the age of 18 years, and have a minimum of three months of chronic non-cancer pain. The questionnaires took approximately 20–45 min to complete and responses were anonymous unless respondents opted to be contacted about further related research in which case personal details were kept confidential.

2.1.1. Paper and pencil sample

Three hundred questionnaire packs were posted to members of the Irish Chronic Pain Association (ICPA) and included a cover letter and postage-paid return envelope. The response rate was 26.3% (79 questionnaires returned). The questionnaire also was distributed to local pain clinics and physiotherapy practices (65 questionnaires were distributed and 15 returned, a response rate of 23.1%) and posted to members of the public who heard about the study and requested questionnaire packs (23 out of 44 were returned; a response rate of 52.3%).

2.1.2. Web survey

Three hundred and ninety-six online participants completed the same items using an online survey tool (SurveyMonkey.com, [18]). Participants were accessed through chronic pain-related discussion groups, forums and websites which hosted a link to the questionnaire.

2.2. Participants

In some cases there were large sections of missing data when respondents skipped sections or stopped answering before the end of the questionnaire (particularly in the online sample). Participants that omitted more than 10% of items from any subscale were excluded ($n = 85$). The total sample size for analysis was 428. There were no significant differences between those included and those excluded in terms of age, sex, education level, pain duration, number of painful conditions reported, pain severity, pain interference, pain frequency, anxiety, depression or pain acceptance levels.

The online sample consisted of 319 participants from a number of different regions including the UK (44.5%), USA (33.1%), Ireland (10.7%), and Australia (6.6%). The paper and pencil sample consisted of 109 respondents, all of whom resided in Ireland. Sociodemographic characteristics and pain-related information for both groups are summarised in Table 1.

2.3. Measures

2.3.1. Demographics and chronic pain details

Participants were asked to supply details regarding age, gender, occupational and relationship status as well as duration of chronic

Table 1
Sample characteristics.

	Internet sample	Paper and pencil sample
	Mean (SD) or % $n = 319$	Mean (SD) or % $n = 109$
Age	44.6 (12.6)	54.0 (12.1)
Pain duration (months)	140 (125.6)	169.9 (126.2)
Female (%)	79.6	83.2
Married/co-habiting (%)	72.7	61.5
<i>Pain in</i>		
Lower limbs (%)	41.9	24.2
Upper limbs (%)	38.6	21.6
Chest (%)	27.3	8.3
Back and neck (%)	47.0	49.5
Abdomen (%)	19.7	7.8
Head (%)	39.5	26.6
<i>Work status affected by pain (%)</i>		
Not working (%)	55.2	43.1
Working full time (%)	54.2	71.6
Working part time (%)	22.6	13.8
Studying (%)	10.7	12.8
<i>Education level</i>		
Primary (%)	7.8	1.8
Secondary/high school (%)	1.6	7.1
Tertiary/college (%)	31.3	52.2
<i>Cause(s) of pain</i>		
Arthritis (%)	67.1	40.7
Fibromyalgia (%)	35.1	29.8
Headaches/migraine (%)	42.6	22.8
Nerve damage/pain (%)	27.6	15.8
Disc problems (%)	32	47.4
Sciatica (%)	27.6	34.2
Post-surgical pain (%)	17.6	14
Traumatic injury (%)	12.5	9.6
	14.1	20.2

Note. Participants could endorse multiple sites and causes of pain.

pain, site(s) of chronic pain, and cause of chronic pain. Some details about medical and alternative treatment were requested, with items modelled after a survey of chronic pain in Europe [4].

2.3.2. Acceptance

The Chronic Pain Acceptance Questionnaire (CPAQ) [32] is a 20-item inventory measuring acceptance of pain. This measure has two subscales: *activity engagement (AE)* and *pain willingness (PW)*. Participants rate items on a scale from 0 (never true) to 6 (always true). Higher scores denote greater activity engagement and pain willingness (pain willingness items are reverse scored). Studies indicate reasonable reliability ($\alpha = .72-.91$) and validity suggested by high correlations with measures of avoidance, distress, and daily functioning. Two recent confirmatory factor analyses provide further support for the two-factor structure of the scale [48,49].

2.3.3. Anxiety and depression

The Hospital Anxiety and Depression Scale (HADS) [52] contains 14 items and was designed for use in medical outpatient clinics. This measure evaluates severity of anxiety and depression without contamination of scores by reports of physical symptomatology. Each item is scored from 0 to 3 with total scores ranging from 0 to 21 for each subscale. Higher scores indicate greater anxiety or depression. The HADS possesses good psychometric properties and has been assessed for use in musculoskeletal patients [42] and people living with spinal cord injury [51] though in both instances item 7 (“I can sit at ease and feel relaxed”) was found to be somewhat problematic. Administration of the HADS in an Internet sample also has been shown to provide meaningful and valid data [1].

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