



Pain-related self-efficacy beliefs in a Brazilian chronic pain patient sample: a psychometric analysis

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Summary

While some people become severely or moderately disabled by chronic pain (pain that persists >3 months), others seem to adjust reasonably well to it. Higher levels of disability are often associated with higher levels of distress, and this relationship can be bidirectional resulting in a vicious cycle. There is evidence suggesting that self-efficacy is one of the most important contributors to disability and emotional adjustment to chronic pain. Defining pain self-efficacy beliefs as confidence in ability to function despite pain, the Pain Self-Efficacy Questionnaire (PSEQ) has been widely used to examine the role of self-efficacy in chronic pain patient populations. However, to date it has not been validated in Brazil. This study examined the reliability and validity of the PSEQ in a Brazilian chronic pain population. Data were collected from a convenience sample of 348 chronic pain patients. Reliability of the PSEQ has been found to be adequate (split-half correlation was 0.76 and internal consistency was 0.90). Factor analysis indicated the existence of only one factor. Discriminant and concurrent validity were also adequate. Altogether these results indicate that the PSEQ has good psychometric properties when used in this sample. These findings are also consistent with those previously published in the literature. Copyright © 2007 John Wiley & Sons, Ltd.

Key Words

chronic pain in Brazil; self-efficacy beliefs; distress; psychometric properties

Introduction

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While some people become very disabled by chronic pain (pain that lasts longer than 3 months on most of the days over the past 6 months), others seem to adjust to it reasonably well (Blyth et al., 2001). Higher levels of disability are often associated with higher levels of distress, and this relationship can be bidirectional and turn into in a vicious cycle (Chapman & Gavrin, 1999).

There is evidence that the relationship between pain, distress and disability is mediated by cognitive variables (Linton, 2000; Pincus, Burton, Vogel, & Field, 2002). Of these cognitive mediating factors, self-efficacy seems to be one of the most important (Nicholas & Asghari, 2006; Turk & Okifuji, 2002).

Bandura, 1977 defined self-efficacy as the degree of conviction held by a person that he/she can successfully perform a specific behaviour required to produce a given outcome. Bandura argued that self-efficacy is a determinant of a person's willingness to continue in the face of difficulties and aversive situations (e.g. chronic pain).

In the pain literature, one approach to self-efficacy has been to relate it to confidence in coping with pain, such that patients with high self-efficacy are more likely to mobilize resources to persevere in their efforts to cope with pain (Turk & Okifuji, 2002). An alternative approach has been to relate self-efficacy to confidence in being active despite pain, such that patients who are high in self-efficacy are more likely to persevere with activities despite continuing pain (Nicholas, 2006). In both cases, low self-efficacy is associated with greater disability and distress.

There is considerable evidence supporting these approaches to self-efficacy in chronic pain (Keefe, Rumble, Scipio, Giordano, & Perri, 2004; Turk & Okifuji, 2002). Arnstein, Caudill, Mandle, Norris, and Beasley (1999), and Asghari and Nicholas (2001) have found that self-efficacy is an important mediator between pain intensity and disability, as well as a significant predictor of depression in chronic pain patients (Nicholas & Asghari, 2006). Jensen, Turner, and Romano's (1991) and Turner, Ersek, and Kemp's (2005) findings suggest that self-efficacy plays a significant role on the use of different coping strategies among chronic pain patients.

Despite the accumulating evidence on the importance of self-efficacy in pain-related disability and distress, there are few standardized measures of these beliefs and only one, the Pain Self-Efficacy Questionnaire (PSEQ, Nicholas, 1989), that is usable across countries to assess confidence in functioning despite pain, along the lines proposed originally by Bandura (1977). While the PSEQ has been translated into Chinese, German and Malay, there is no validated Portuguese translation for use in a Brazilian chronic pain population.

The present study examined the reliability and validity of the PSEQ (Nicholas, 1989) in chronic

pain patients attending pain clinics in Brazil. Once the psychometric properties of this measure are proven to be adequate in this population, it is envisaged that the instrument could be used in both clinical and research work with Brazilian chronic pain patients.

Methods

Participants

Data were collected from 348 patients attending pain clinics in Brazil (from March to June 2005). The participants represent a convenience sample, selected on specific criteria.

Inclusion criteria

- Having chronic pain, and willing to participate in the study;
- Aged 18 years and above; and
- Literate in Portuguese; ≥ 4 years of formal education.

Exclusion criteria

- Cancer pain;
- Major psychiatric disorder (i.e. psychoses or dementia), as assessed by the treating doctor.

Procedure

The translation of the PSEQ (Nicholas, 1989) into Portuguese was performed according to a back-translation method (Guillemin, Bombardier, & Beaton, 1993). Apart from a few minor syntax changes, the Brazilian version of the PSEQ had a high concordance with the original version.

The Brazilian version of the PSEQ was then included in a battery of questionnaires and administered to patients attending nine pain clinics in southern and southeast Brazil by the first author who explained the purpose of the study and obtained the patients' written consent. Approval for the study was obtained from the ethics committee at each institution.

Measures

The socio-demographic and clinical questionnaire. This sought information regarding age,

gender, level of education, working status, pain site, pain intensity, pain duration and other variables not described in this article.

The Roland and Morris Disability Questionnaire-Brazilian version. The Roland and Morris Disability Questionnaire (RMDQ, Roland & Morris, 1983) was initially developed to measure self-rated physical disability in back pain patients, but the version used here has been adapted for people with generalized chronic pain (Asghari & Nicholas, 2001), by replacing the word 'back' with 'pain'. It has 24 items; each item is scored 0 or 1, yielding a range from 0 (no disability) to 24 (severe disability).

The RMDQ original version is widely used and has strong psychometric properties (Robinson, 2001; Roland & Fairbank, 2000; Roland & Morris, 1983). The RMDQ Brazilian version is also valid and reliable (Cronbach's alpha = 0.90, split-half correlation coefficient = 0.82) (Sardá et al., 2006).

The PSEQ. The PSEQ (Nicholas, 1989) is based on Bandura's self-efficacy theory, and assesses a person's confidence in their ability to function despite pain. It is also based on the view that functioning despite pain is one of the main goals in pain management (Nicholas, 2006; Nicholas, Wilson, & Goyen, 1991).

The PSEQ has 10 items, reflecting tasks frequently reported as problematic by patients with chronic pain (e.g. household chores, socializing with friends). The items are rated on a 0–6 Likert scale, with 0 = not at all confident and 6 = completely confident (that the person can do the task despite pain). Higher scores reflect stronger self-efficacy beliefs.

PSEQ has been used in a number of countries and its psychometric properties have been reported as adequate. Factor analysis has shown the existence of only one factor (Nicholas, 2006). High internal consistency coefficient (0.92–0.94) has been reported in three studies, as well as adequate test-retest correlation coefficients (Asghari & Nicholas, 2001; Gibson & Strong, 1996; Nicholas, 2006). Williams et al. (1993) reported that the PSEQ is sufficiently sensitive to detect clinically relevant changes in a chronic pain sample undergoing pain management treatment and that its scores are not simply a reflection of pain intensity.

Data analysis

The examination of the questionnaire's psychometric properties included descriptive statistics, reliability analysis (Cronbach's alpha and Pearson correlation), and validity analysis using factor analysis, inter-scale correlation and correlations with other variables.

Questionnaires with missing items of <10 per cent of the total items were included in the analyses (with missing items replaced by respective mean scores). Those questionnaires with missing items >10 per cent of the total were excluded from the final sample.

All analyses were conducted using the SPSS-14.0 for Windows package.

Results

Of the 348 participants who participated in this study, 37 (11 per cent) were excluded from the analysis due to incomplete data. The final sample consisted of 311 participants. No significant differences were found between the initial and the final sample (e.g. age, level of education, pain intensity). The vast majority of the participants completed the PSEQ without difficulty.

Descriptive statistics

The participants' mean age was 48.9 years (standard deviation [SD] = 14.06), most were women (74 per cent) and married (64.3 per cent). Education level was evenly distributed among subjects (4 to 8 years of education, 9 to 12 years of education and tertiary education). Mean pain duration was 4 years (SD = 1.6). Mean pain intensity was 6 out of 10 (SD = 2.4). Most participants had pain in two or more sites (45 per cent), were taking medication (82.4 per cent), and 41.1 per cent were unemployed due to pain.

The PSEQ mean score was 34.8 (SD = 14.8). Skewness (-0.28) and kurtosis (-0.63) coefficients indicate data were normally distributed and with no outliers (Tabachnick & Fidell, 2001).

Reliability

The internal correlation coefficient for the PSEQ (Cronbach's alpha) was 0.90 and suggests inter-

Table I. PCA of the PSEQ factors loading and communalities for a one factor solution, item-total correlations, item mean and standard deviations.

Item number and description	Factor loading	b^2	Item-total correlation	Mean and SD
1. I can enjoy things, despite the pain.	0.81	0.66	0.79	3.8 (1.7)
2. I can do most of my household chores (e.g. tidying up, washing dishes, etc.), despite the pain.	0.73	0.54	0.73	3.5 (2.0)
3. I can socialize with my friends and family members as often as I used to do, despite the pain.	0.67	0.44	0.67	3.9 (2.0)
4. I can cope with my pain in most situations.	0.72	0.52	0.71	3.8 (1.7)
5. I can do some form of work despite the pain (work includes housework, paid and unpaid work).	0.76	0.58	0.76	3.8 (1.9)
6. I can still do many of the things I enjoy doing such as hobbies or leisure activities, despite the pain.	0.77	0.60	0.77	3.3 (2.0)
7. I can cope with my pain without medication.	0.44	0.20	0.50	1.9 (2.0)
8. I can still accomplish most of my goals in life, despite the pain.	0.83	0.69	0.82	3.6 (1.9)
9. I can have a normal lifestyle, despite the pain.	0.81	0.65	0.80	3.7 (2.0)
10. I can gradually become more active, despite the pain.	0.80	0.64	0.79	3.5 (1.8)
Eigenvalue	5.53			
Percentage variance	55.29			

nal consistency is adequate (Nunnally & Bernstein, 1994). The split-half correlation coefficient (Pearson) was 0.76, indicating a high consistency between the two halves of the scale.

Validity

Table I shows the results of factors analysis and item-scale correlation.

Preliminary factor analysis using oblique and orthogonal rotation suggested the existence of only one factor (eigenvalue greater than one criterion). This factor accounts for 55.29 per cent of the total variance, with a moderate to high factor loading in all items except for item 7 (assessing confidence in coping with pain without medication) (loading value = 0.44, communalities = 0.20). But this loading is still above the 0.30 cut-off point recommended by Floyd and Widaman (1995). This pattern is similar to those recently reported (Nicholas, 2006). Accordingly, item 7 was retained in the scale.

Moderate item-scale correlations range from 0.50 to 0.82 suggests that all items are adequately related to the total score. These findings and the principal component analysis (PCA) confirm the construct and convergent validity of the PSEQ.

To test the relationship between demographic variables and PSEQ scores, *t*-test and analysis of variance were conducted. There were no significant differences ($p \leq 0.01$) between gender ($t =$

-2.08) and educational level ($f = 3.37$) and mean scores on self-efficacy. However, there was a significant difference ($t = 5.22, p \leq 0.001$) on PSEQ mean scores regarding work status (people not working due to pain reported significantly lower scores than those working). Differences associated with working status suggest that the PSEQ has concurrent validity and is capable of identifying distinct outcomes.

Correlational analysis

The relationships between the PSEQ, RMDQ and demographic and clinical variables were also examined.

Due to the number of correlations (6), alpha level was adjusted to reduce the risk of a Type I error. A Bonferroni adjusted value for alpha was set at $0.05/6 = 0.008$ so that only a $p \leq 0.008$ was considered significant. See Table II.

There were significant, but low to moderate correlations between pain intensity and scores on the PSEQ and RMDQ. As expected there was a significant negative and moderate correlation between disability (RMDQ) and pain self-efficacy beliefs (PSEQ).

Discussion

The PSEQ was acceptable to almost all patients and the internal reliability of the scale was con-

Table II. Correlations between clinical variables, the PSEQ and the RMDQ.

	1	2	3	4
1. Pain duration	—			
2. Pain intensity	-0.01	—		
3. RMDQ total score	0.08	0.31*	—	
4. PSEQ total score	-0.07	-0.25*	-0.58*	—

* Correlation is significant at $p \leq 0.001$.

firmed, consistent with previous findings (0.92) (Nicholas, 1989, 2006). The validity of this measure was also confirmed, with a factor analysis yielding only one factor. This is in accordance with the initial validation of the PSEQ (Nicholas, 1989) and other studies (Nicholas, 2006).

A moderate correlation between self-efficacy and disability has been reported by a number of studies (-0.60) (Nicholas, 2006) and (-0.58) (Nicholas & Asghari, 2006), and this was confirmed in the present study. The finding of a low correlation between self-efficacy and pain intensity was also consistent with earlier studies (Nicholas, 2006). The moderate correlation between self-efficacy and disability indicate that while moderately related, these measures assess different constructs. This indicates that the PSEQ has adequate discriminant validity. These findings also suggest that disability is not simply a function of pain intensity, but is also related to the cognitive construct of self-efficacy.

There were significant mean differences between the Brazilian version of the PSEQ (34.08; SD = 14.08) and the original version of the PSEQ (Nicholas, 2006) (25.08; SD = 12.4; $t = 4.68$ at a $p \leq 0.001$ expected t is 3.26). It is unclear why this difference occurred but socio-cultural factors may play a role, especially given the similarity in findings from the PSEQ between England and Australia (Williams et al., 1993 reported a mean PSEQ score of 24.1, SD = 11.4, in a heterogeneous chronic pain patient sample in London). Another possible reason for the difference in self-efficacy between the Brazilian and the Australian samples could be a difference in mood state as that is known to be related to self-efficacy (Nicholas & Asghari, 2006), but although not shown here, no difference was found on depression scores between the two samples.

Altogether, these findings suggest that the Brazilian version of the PSEQ has adequate validity and reliability among Brazilian chronic pain patients.

The availability of a sound measure that assesses confidence in ability to function despite pain should provide a useful tool to both clinicians and researchers in Brazil.

The stability of this measure over time with Brazilian chronic pain patients has yet to be established, but previous research in other countries suggests the stability should be acceptable.

References

Arnstein, P., Caudill, M., Mandle, C.L., Norris, A., & Beasley, R. (1999). Self-efficacy as a mediator of the relationship between pain intensity, disability and depression in chronic pain patients. *Pain*, 80, 483-491.

Asghari, A., & Nicholas, M.K. (2001). Pain self-efficacy beliefs and pain behaviour: A prospective study. *Pain*, 94, 85-100.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*, 84, 191-215.

Blyth, F.M., March, L.M., Brnabic, A.J.M., Jorm, L.R., Williamson, M., & Cousins, M.J. (2001). Chronic pain in Australia: A prevalence study. *Pain*, 89, 127-134.

Chapman, R.C., & Gavrin, J. (1999). Suffering: The contributions of persistent pain. *The Lancet*, 353, 2233-2237.

Floyd, F., & Widaman, K. (1995). Factor analysis in the development and refinement of clinical assessment instruments. Special issue: Methodological issues in psychological research. *Psychological Assessment*, 7, 286-299.

Gibson, L., & Strong, J. (1996). The reliability and validity of a measure of perceived functional capacity for work in chronic back pain. *Journal of Occupational Rehabilitation*, 6, 159-175.

Guillemain, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46(12), 1417-1432.

Jensen, M.P., Turner, J.A., & Romano, J.M. (1991). Self-efficacy and outcome expectancies: Relationship to chronic pain coping strategies and adjustment. *Pain*, 44, 263-269.

Keefe, F.J., Rumble, M.E., Scipio, C.D., Giordano, L.A., & Perri, L.M. (2004). Psychological aspects of persisting pain: Current state of the science. *The Journal of Pain*, 5(4), 195-211.

Linton, S.J. (2000). A review of psychological risk factors in back and neck pain. *Spine*, 25(9), 1148-1156.

Nicholas, M.K. (1989). *Self-efficacy and chronic pain*. Paper presented at the British Psychological Society, London.

Nicholas, M.K. (2007). The Pain Self-Efficacy Questionnaire: Taking pain into account. *European Journal of Pain*, 11, 153-163.

Nicholas, M.K., & Asghari, A.M. (2006). Investigating acceptance and adjustment in chronic pain: Is acceptance broader than we thought? *Pain*, 124, 269-279.

Nicholas, M.K., Wilson, P.H., & Goyen, J. (1991). Operant-behavioural and cognitive-behavioural treatment for chronic low-back pain. *Behavioural Research Therapy*, 29, 225-238.

Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Pincus, T., Burton, A.K., Vogel, S., & Field, A.P. (2002). A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. *Spine*, 27(5), 109-120.

Robinson, J.P. (2001). Disability evaluation in painful conditions. In D.C. Turk, & R. Melzack (Eds), *Handbook of pain assessment* (2nd ed., pp. 248–272). New York: Guilford Press.

Roland, M., & Fairbank, J. (2000). The Roland-Morris Disability Questionnaire and the Oswestry Disability Questionnaire. *Spine*, 25(24), 3115–3124.

Roland, M., & Morris, R. (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(2), 141–144.

Sardá, J.J., Nicholas, M.K., Pimenta, C.A.M., Asghari, A., Corrêa, C.F., Oswaldo, J.J., Hennmann, L., Pereira, I., Shih, L.M., & Kurita, G. (2006). *Validade e fidedignidade do Questionário Roland Morris de Incapacidade em uma população de Brasileiros com dor crônica*. Paper presented at the 7 Congresso Brasileiro de Dor, Gramado.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics*. Boston: Allyn and Bacon.

Turk, D.C., & Okifuji, A. (2002). Psychological factors in chronic pain: Evolution and revolution. *Journal of Consulting and Clinical Psychology*, 70(3), 678–690.

Turner, J.A., Ersek, M., & Kemp, C. (2005). Self-efficacy for managing pain is associated with disability, depression and pain coping among retirement community residents with chronic pain. *The Journal of Pain*, 6(7), 471–479.

Williams, A.C.d.C., Nicholas, M.K., Richardson, P.H., Pither, C.E., Justins, D.M., Chamberlain, J.H., Harding, V.R., Ralphs, J.A., Jones, S.C., Dieudonne, I., Featherstone, J.D., Hodgson, D.R., Ridout, K.L., & Shannon, E.M. (1993). Evaluation of a cognitive behavioural programme for rehabilitating patients with chronic pain. *British Journal of General Practice*, 43, 513–518.