Validation of the Pain Catastrophizing Scale (PCS) in Iran

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ABSTRACT

Introduction: Pain Catastrophizing Scale (PCS) is an instrument designed to measure catastrophic thinking. This study aimed to translate PCS to Persian and validate it in Iran.
Methods: This was a cross-sectional study conducted in a private practice, a physical therapy unit in a polyclinic, and psychiatry and physiatry clinics in shahid modarres university hospital, in Tehran, Iran. Forward-backward translation was applied to translate the questionnaire from English to Persian. 116 patients suffering from non-malignant musculoskeletal pain participated in the study. Reliability and Validity were assessed using internal consistency and known-groups comparison respectfully. Factor analysis was performed to examine the scale structure.
Results: The mean PCS score was 19.7 (SD = 11.56). Cronbach's alpha score of reliability was 0.93. Known-groups comparison showed that the PCS was able to differentiate between male and female. Factor analysis showed a two-factor structure for the instrument that jointly explained the 68.1% of the variance observed.
Conclusion: The Iranian version of PCS is a valid and reliable instrument for measuring pain catastrophizing in Iran. The PCS now can be used in rehabilitation practice and pain clinics in Iran to implement tailored interventions for patients who are suffering from pain.
KEY WORDS: Pain Catastrophizing Scale; Validation study; Iran

1. INTRODUCTION

Catastrophizing is defined as exaggerated negative thoughts ahead actual or anticipated painful experience (1). It comprises three dimensions known as rumination, magnification, and helplessness (2). Catastrophizing not only causes an increase in perception of pain and emotional distress, but also may prolong pain episodes. The association between pain and catastrophizing is well documented (2-4). Even; it has been shown that if the evaluation is made at a short interval after occupational injury, it can predict the possibility of disability and chronic pain (5). These findings suggest that if catastrophizing decreases, the pain intensity, disability and chronic condition would decrease (6, 7). In addition it has been shown that patients' pretreatment beliefs could influence the long-term decrease of pain intensity, indicating that more attention should be paid on patients' pretreatment beliefs (8). A study reported that pain catastrophizing was associated with symptom number and symptom severity and the relation between pain catastrophizing and illness severity remained significant even when controlling for initial symptom severity, duration of the symptoms before the study period, and depression (9). The Pain Catastrophizing Scale (PCS) was developed for measuring pain catastrophizing in 1995 and showed satisfactory psychometrics properties (1, 10, and 11). In addition, psychometric properties of the questionnaire have been reported at least for 10 other languages including German, Dutch, Chinese and Spanish (12, 16). Since this instrument was not available in Iran, this study aimed to translate and validate the instrument in Iran in order to contribute both to research and practice.

2. MATERIALS AND METHODS

2.1. Study population and sampling

A purposive sample of patients was entered into the study. They were selected from three collaborating centers during three months. The centers included a private practice, a physical therapy unit in a polyclinic, and psychiatry and physiatry clinics in shahid modarres university hospital in Tehran, Iran. A minimum of 100 patients was estimated to enroll into the study according to the estimations

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suggested by other investigators (17, 18). Inclusion criteria were defined as non-malignant musculoskeletal pain syndromes at spine and/or extremities of any duration. We excluded patients with a history of malignant disorders and patients unable to understand Persian. A physiatrist (Medical doctor who is specialist in physical medicine and rehabilitation) was responsible to define non-malignant pain. All patients with a history of malignant disease were excluded from the study as well as those with "Red flags" in their history or physical examination or complementary paraclinical tests (if needed).

2.2. Pain Catastrophizing Scale

The Pain Catastrophizing Scale (PCS) was designed by Sullivan MJ as a 13-item instrument to measure the degree of catastrophizing (1). Each item evaluates the degree of patient's feelings or thoughts in painful situations or during pain anticipations. The scale includes three sub-scales: rumination, magnification and helplessness. Patients respond to each question according to their subjective mental preoccupation on a 5-Point Likert Scale ranging from 0 (not at all) to 4 (all the time) giving a total score ranging from 0 to 52. Scores higher than 30 are suggestive of increased probability for developing chronic pain/disability and indicate the necessity of psychological interventions.

2.3. Translation process

After asking permission from the author (Sullivan MJ), 'forward-backward' procedure was applied to translate the original questionnaire from English into Persian (the Iranian language) (19, 20).Two independent translators translated the questionnaire. Persian versions then were compared and discussed in an expert panel and consensus was reached upon a combination of the two translations. A third independent translator back translated the provisional Persian version into English. The backward English version was assessed by Sullivan MJ and compared with the original version. Then, the comments were discussed in the expert panel and the following modifications were made:

- There was a typing error in item 5 that was corrected.
- Item 9 of the original instrument indicates 'inability' but it was translated 'I do not believe I can'. This also was modified.
- 'I keep thinking' in items 10 and 11 were translated into 'all the time I am thinking'. Sullivan MJ criticized this, as the original wording reflects the persistence of thoughts and not the degree that the person thinks in this way. Unfortunately, in Persian these are almost the same and we did not have other options.
- 'Wonder' in item 13 was translated into 'worry' according to the Sullivan MJ advice.
- The modified Persian version was provided for pilot testing (the preliminary version).

2.4. Pilot Study

Fifteen volunteers who were suffering from non-malignant musculoskeletal pain syndromes filled in the preliminary questionnaire. They were also asked to report any problem with understanding and comprehending the items. No ambiguity or misinterpretation was reported and thus the same version was used as the final version.

2.5. Statistical analysis

Reliability of the PCS was evaluated by the internal consistency calculating Cronbach's alpha score. The Cronbach's alpha score of equal or greater than 0.7 was considered acceptable (21). Validity was assessed using known-groups comparison. It was hypothesized that females would be more likely to score higher on the PCS than male respondents. The t-test was used for comparison. Finally, factor analysis was performed using principal component method with varimax rotation. Factor loading equal or greater than 0.4 was considered satisfactory. Statistical analysis was performed using SPSS version 14 (SPSS Inc. Chicago, Illinois, United States of America).

2.6. Ethics

The Research Ethics Committee of Iranian Academic Centre for Education, Culture and Research-ACECR approved the study (registration number 1592-11). The aim and confidentiality policy of the study were explained to the patients and all of participants signed the written consent form. They were assured that there would be no compromise in the quality or quantity of their medical treatment if they reject enrolling in the study or if at any time they decide to exit the study.

3. RESULTS

3.1. Socio-demographic characteristics

One hundred and sixteen patients including 75 (64.7%) female and 41 male (35.3%) participated in the study. The mean age of participants was 41 (SD: 6.4) years. Forty four percent of patients had

secondary education and the majority of patients were suffering from spinal pain. We found no significant difference between patients score and their age, sex, and educational level (P=0.065).

3.2. Reliability and validity

The mean PCS score for whole sample was 19.7 (SD: 11.56) ranging from 0 to 50. The Cronbach's alpha score for reliability test was 0.93 indicating an excellent result. The results of known group comparison test for validity indicated that the PCS was able to discriminate well between males and females as hypothesized. Total catastrophizing scores as well as rumination and helplessness were higher in women. However, no association was found between magnification and gender.

3.3. Factor Analysis

The factor structure of the questionnaire was examined by performing the Principal Component Analysis with varimax rotation. The results revealed a two-factor structure for the PCS: 'Fear of pain' and 'Concentrating on pain' that jointly accounted for explaining the 68.1% of the variance observed.

4. DISCUSSION

Translation and standardization of questionnaires are crucial components of cultural adaptation of standard instruments, enabling reliable comparison between health outcomes among different communities. Finding appropriate words sometimes become a great challenge for translators. Fortunately, we benefited from the cooperation of the instrument's leading author (Sullivan MJ) that was very helpful to solve challenges encountered by us during the translation process. It seems that this is a very assuring approach in translating a questionnaire from one language into another language.

Internal consistency of the PCS as calculated by Cronbach's alpha was found to be excellent (0.93). German and Chinese investigators also reported similar findings (0.91 and 0.93, respectively) (13, 15). However, for the Spanish version alpha coefficient was 0.73 (16).

Compared to men, women had higher scores not only for total score but also for rumination and helplessness sub-scales. These findings are in accordance with previous studies indicating that there were sex differences in catstrophizing score (1, 13, and 22). Higher scores might be an indication that female patients in importance of gender role when interpreting the findings from the PCS (1, 13). In contrast a recent study reported that males and female did not significantly differ with respect to the extent of pain catastrophizing, neither in the overall analysis nor for specific pain types (23). However in any case, evidence suggests that high catastrophizing scores may be a risk factor for heightened pain and therefore identification of patients prone to catastrophizing in advance of treatment might serve as a basis for beginning any possible psychological or pharmacological therapy, with the potential for reducing or eliminating excessive pain experienced by patients (24).

Having performed varimax method for factorial analysis of the PCS, a two-factor structure was revealed, namely 'fear of pain' and 'concentrating on pain' that was to some extent different from the original factor structure of the questionnaire. The original English version as explained before exhibited a three-factor structure (rumination, magnification, and helplessness) (1) while the current study indicated a two-facture structure (fear of pain and concentrating on pain). However, in our study the items loaded on factor 2 (concentrating on pain) was identical to the original factor namely rumination. Two previous studies in Dutch adult community including various subgroups of people with musculoskeletal pain and in German patients with chronic low back pain three factors with an almost identical factor structure to the original validation study was reported (13, 14). Osman et al. have conducted three studies to evaluate the factor structure, reliability, and validity of the PCS in the USA. In Study I, they conducted principal-components analysis with oblique rotation to replicate the three factors of the PCS. In Study II, they conducted confirmatory factor analyses to evaluate the adequacy of fit of four alternative models. In Study III, they evaluated the ability of the PCS and subscales to differentiate between the responses of clinic (students seeking treatment) and non-clinic undergraduate samples. Although they have reported satisfactory results for the PCS, they found that a two-factor structure indicated a better fit to the data (25).

There is evidence that catastrophizing contributes to the progression of chronic pain and disability, and therefore should be considered as important factors when evaluating and developing treatment plans for patients who suffer from pain (26). Even it is argued that pain catastrophizing has a social function and could affect family or significant others. Thus recently the significant other version of the Pain Catastrophizing Scale (PCS-S) also is developed (27).

5. CONCLUSIONS

In summary, the Iranian version of PCS is a reliable and valid instrument in measuring pain catastrophizing among Persian speaking patients. It can serve both basic and clinical scientists, providing them a standard instrument for measuring pain catastrophizing that ultimately might lead to pain reduction in patients suffering from agony. The future studies should focus more on clinical application of the scale and perhaps provide additional evidence to ensure its psychometric properties in Iran.

Acknowledgements

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