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Translation of pain self-efficacy questionnaire into Gujarati language and analysis of psychometric properties in subjects with musculoskeletal pain

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Abstract:

BACKGROUND: Musculoskeletal disorders (MSDs) are a leading cause of disability worldwide. Musculoskeletal conditions are typically characterized by pain which is often persistent and limits one's mobility, dexterity, and functional ability, reducing people's ability to work and participate in social roles with associated impacts on mental well-being. The Pain Self-Efficacy Questionnaire (PSEQ) is a 10-item questionnaire, developed to assess the confidence of people with ongoing pain; in performing activities with pain. The PSEQ scale is applicable to all persisting pain presentations. The study aims to translate PSEQ into Gujarati and analyze its psychometric properties in subjects with musculoskeletal pain.

MATERIALS AND METHODS: Prior permission from the author was taken for the translation of PSEQ scale into Gujarati language. The translation procedure was carried out according to the guidelines provided by the WHO with forward and backward translation. Thereafter to analyze the psychometric properties of the scale, a total of 30 subjects (mean age of 45.43 ± 17.02) with different MSDs were enrolled in the study. The concurrent validity was obtained by establishing a correlation between the Gujarati translated version of PSEQ (PSEQ-G) and Visual Analog Scale (VAS). The intra-rater reliability was established by test-retest method within a span of 2 days. The questionnaire was again administered after 1 week by two different investigators to test the inter-rater reliability.

RESULTS: The concurrent validity was established with a moderate strength negative correlation between PSEQ-G and VAS ($r = -0.398$, $P < 0.05$). The intra-rater reliability was found between 0.887 and 0.980 (intraclass correlation coefficient [ICC] = 0.955) and inter-rater reliability was between 0.848 and 0.958 (ICC = 0. 917). There was a high internal consistency with Cronbach's alpha 0.938. Bland-Altman plot analysis was performed for PSEQ-G scores between the two raters which showed agreement between the two scores within the limits of agreement with a 95% confidence interval. The linear regression showed no proportional bias.

CONCLUSION: The results showed fair concurrent validity with a weak correlation between VAS and PSEQ-G scores (Gujarati version of PSEQ) and excellent inter-and intra-rater reliability for PSEQ-G in subjects with MSDs.

Keywords:

Concurrent validity, Gujarati translated Pain Self-Efficacy Questionnaire, inter-and intra-rater reliability

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Introduction

Musculoskeletal disorders (MSDs) are one of the major causes of morbidity

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and the second most common cause of disability worldwide. The global prevalence of MSDs ranges from 14% to as high as 42%; on the other hand, in India, epidemiological studies indicate a community-based prevalence of about 20%.[1] The umbrella term of MSDs includes conditions such as neck pain, back pain, knee pain, shoulder pain, and many other such etiologies. These etiologies bring in acute or chronic pain.

According to the international association for study of pain (IASP) task force, pain is an "unpleasant sensory and emotional experience associated with, or resembling that associated with actual or potential tissue damage." The pain can have a neuropathic, nociceptive, visceral, or autonomic origin. The nociceptive pain in many musculoskeletal conditions can be acute or chronic. The IASP defines chronic pain as a condition of pain persisting for more than 3 months or after the actual cause of pain is resolved.[2] Chronic pain is maintained in part by central sensitization, a phenomenon of synaptic plasticity, and increased neuronal responsiveness in central pain pathways after painful insults.[3] The components of pain perception are multidimensional and subjective in nature. These include perceptual, affective, cognitive, and behavioral.[4]

The Pain Self-Efficacy Questionnaire (PSEQ) is a clinical tool that measures self-efficacy beliefs in subjects with chronic pain. In PSEQ scale, the self-efficacy beliefs in people with chronic pain were assessed either with reference to confidence in ability to perform specific tasks or with confidence in performing more generalized constructs such as coping with pain.

The PSEQ scale is applicable to all persisting pain presentations. The original version of PSEQ is in English language. However, Gujarat is an Indian state where the majority of people communicate in Gujarati language. The robust research on the psychological and behavioral aspects of chronic pain arises a need for translation of PSEQ in Gujarati for Gujarati population, which will prove helpful in objectifying the self-efficacy and confidence in subjects with chronic MSDs for Gujarati population.

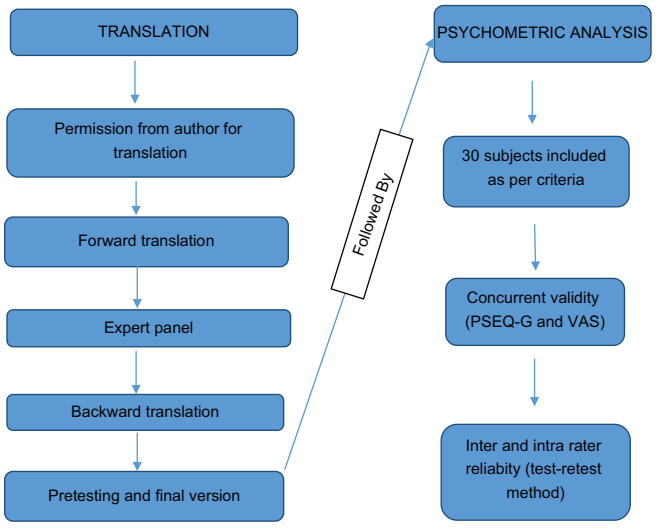

Chart 1: Procedural flow chart

The aim of the study is to translate the PSEQ scale into Gujarati (PSEQ-G) and to analyze the psychometric properties of PSEQ-G in subjects with musculoskeletal pain.

Materials and Methods

Before the commencement of the study, ethical clearance was taken from the institute. Informed consent was taken from the subjects involved in the study [Table 1].

A cross-sectional study was carried out in the outpatient department setting, Physiotherapy Department of Suresh Brahma Kumar Bhatt College of physiotherapy, Sardar Vallabh Bhai Patel Hospital, Ahmedabad, Gujarat. The study was conducted in two phases; phase 1 of translation followed by phase 2 of analysis of psychometric properties. Initially, the scale was translated into Gujarati version. For this, prior permission was obtained from the author Michael K. Nicholas *et al*. (pain management research institute Sydney, Australia) of PSEQ scale. Thereafter, the psychometric properties of the scale were analyzed.

For this, subjects well acquainted with Gujarati language and with the age group of 20–60 years were included in the study. Subjects with various MSDs such as osteoarthritis (OA) knee, low back pain, sacroiliac joint (SI) joint pain, adhesive capsulitis, bicipital tendinitis, and trapezitis, and chronic in nature with more than 3 months were included in the study. The subjects unable to read and understand Gujarati language were excluded from the study. Subjects with malignancy, pregnancy, lactation, cognitive impairment, and patients with neurological disorders were excluded from the study.

Pain Self-Efficacy Questionnaire

The PSEQ is used to examine and assess self-efficacy beliefs in people with chronic pain. The scale consists of 10 items that were selected to reflect a wide variety of classes of activities and tasks, with indicative examples, commonly reported as problematic by patients with chronic pain.

The process of translation of PSEQ scale was carried out in accordance with the guidelines of the WHO.[5]

The translation and face validation of the PSEQ scale were done by following steps [Chart 1].

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Step 1 – forward translation

For the forward translation of scale, a bilingual Gujarat University accredited translator was approached who was conversant in both English and Gujarati language. The scale was translated from English to Gujarati language.

Step 2 – expert panel

The scale was then given to an expert panel that constituted of two orthopedic surgeons with more than 10 years of experience and three senior physical therapists working in the field of musculoskeletal rehabilitation with more than 10 years of experience. The panel was given the original as well as translated version of the scale. Their inputs regarding the rectification and changes were provided which were put into the final version of the scale.

Step 3 – backward translation

The scale was then backward translated from Gujarati to English by another translator who was blinded from the original English version. Both the original and backward translated scales were compared by authors if there was any change in the original interpretation.

Step 4 – pretesting and final version preparation

In this step, a small population of 12 patients with various MSDs was administered the scale. They were asked to fill up the questionnaire and an in-detail interview was taken about how well they comprehended the components of the scale. The interview consisted of the following questions.

- How well they understood the components of the scale
- If there was difficulty in interpretation about activities put into the scale?
- If they were able to score their self-confidence at ease on the scale anchors?

They were to give a summed-up impact on the clearness of interpreted segments of scale. Their inputs were regarded and the scale was modified accordingly. This made the final version of Gujarati translated PSEQ scale (PSEQ-G).

The final version of PSEQ-G was administered to 30 subjects with various MSDs. The respondents were asked to rate how confident they were that they can do each of the 10 activities or tasks at present despite the pain they were experiencing. Each item was rated by selecting a number on a seven-point scale, where 0 equals "not at all confident" and 6 equals "completely confident." A total score was calculated by summing the scores for each of the 10 items, yielding a maximum possible score of 60. Higher scores reflect stronger self-efficacy beliefs.[6]

Steps for establishing concurrent validity

For establishing concurrent validity, PSEQ-G scale was compared with the standardized visual analog scale (VAS).

The VAS is a type of single-item measure in which the patient indicates his or her quality of life on a line or scale, in which the anchors are usually "best possible quality of life" and "worst possible quality of life." VAS has been used in the measurement of health status and quality of life. When compared with other questionnaires assessing health and quality of life, VAS showed high correlations with health perceptions scale (r = 0.70). The test‑retest reliability intra-class correlation for the VAS was 0.87.[7]

The analysis of psychometric properties was done by recruiting 30 subjects with various MSDs such as OA knee, low back pain, SI joint pain, adhesive capsulitis, bicipital tendinitis, and trapezitis being chronic in the severity of more than 3 months. There were six subjects with OA knee, ten with trapezitis, one with SI joint dysfunction, four with adhesive capsulitis, five with bicipital tendinitis, and four with low back pain.

The subjects were administered Gujarati translated PSEQ version along with VAS.

Reliability

To find the intra-rater reliability, the test–retest reliability was assessed by administering the same scale to the same patient after 48 h. The inter-rater reliability was determined by administering the scale to the same patient by other two different raters who were blinded by the initial readings after 1 week. The 1-week time was elapsed to make sure the subjects do not remember their original scores.

Statistical analysis

The SPSS version 20 and Microsoft Excel 2007 were used to analyze the data obtained (statistical package for the social sciences, SPSS version 20 by IBM, Bangalore). The concurrent validity was established with a negative correlation between PSEQ-G and VAS with Spearman's correlation coefficient with data not normally distributed. The intra-and inter-rater reliability were found with intraclass correlation coefficient (ICC). Bland–Altman test was applied to know the agreement between the scores of two different raters.

Results

Thirty patients participated in the study with the age of (45.43 ± 17.02) and with chronicity of pain (7.65 ± 5.67) having various MSDs. The severity of disease was recorded from VAS (4.95 ± 1.78). The gender distribution was 19 female and 11 male participants. There were six

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subjects with OA knee, ten with trapezitis, one with SI joint dysfunction, four with adhesive capsulitis, five with bicipital tendinitis, and four with low back pain.

The concurrent validity was established with negative Spearman's correlation coefficient ($r = –0.398$, $P < 0.05$). This indicated a moderate strength negative correlation between VAS and PSEQ-G.[8] The intra-rater reliability was found from 0.887 to 0.980 (ICC = 0.955) and inter-rater reliability was from between 0.848 and 0.958 (ICC = 0. 917). This showed good inter-and intra-rater reliability. There was a high internal consistency with Cronbach's alpha 0.938.

A good correlation value does not signify a good agreement. Hence, the Bland–Altman plot was plotted between the PSEQ-G scores of two different raters. The plot showed agreement between two different rater scores of PSEQ-G [Figure 1] with a mean of –0.8667 and upper limit of 5.779 and lower limit of –7.513. The plot showed scores to be within the limits of agreement (LOA) with a 95% confidence interval.

Linear regression analysis was done to ensure no PSEQ-G scores of one rater were higher or lower in proportion to the scores of another rater (proportional bias). In the analysis, the independent variable was the mean of two set of scores, whereas the dependent variable was the difference between two set of scores of two different raters. The linear regression with P value of 0.859 ($P \leq 0.05$) showed no proportional bias.[9]

Discussion

The present study aimed to translate the PSEQ into Gujarati language and to establish its psychometric properties. The PSEQ has been translated into Chinese, Japanese, Dutch, Persian, and Portuguese languages.

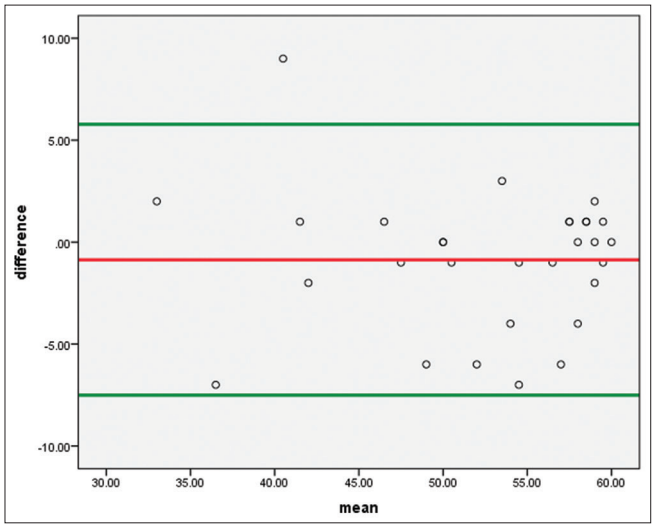

Figure 1: Bland–Altman plot analysis for inter-rater Gujarati PSEQ scores. PSEQ: Pain Self-Efficacy Questionnaire

However, PSEQ has not been translated to Gujarati so far which is a local Indian language. The PSEQ scale has been originally developed to evaluate the self-efficacy beliefs in patients with chronic pain. According to Bandura *et al*., "self-efficacy is defined as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances."[10]

Nicholas *et al*. described Self-Efficacy Scale (the PSEQ) for people in chronic pain to take pain into account when rating their self-efficacy beliefs. The scale does not assess the ability of patient to do activities but rather how "confident" they are in performing the activities in spite of pain.[6]

The results of the present study showed good concurrent validity of PSEQ-G by moderate correlation with VAS (r = –0.39). The construct validity of the original version of PSEQ was established with many health assessing questionnaires such as Sickness Impact Profile (negative correlation) and Coping Strategies Questionnaire (positive correlation) that were significant in nature, unlike the present study that uses only VAS to establish concurrent validity.

PSEQ-G has an excellent inter-and intra-rater reliability with a high Cronbach's alpha of 0.938. This comes in concordance with the original English version of scale that has a high internal consistency with Cronbach's alpha of 0.92. The Cronbach's alpha was found at 0.93 in Chinese PSEQ,[11] whereas 0.88 in Portuguese PSEQ.[12]

The Bland–Altman plot analysis showed a good agreement between the two rater scores and within the LOA with a 95% confidence interval.

The present study has a limitation of smaller sample size compared to other versions such as Japanese PSEQ (n = 176) and Chinese PSEQ (n = 120). Furthermore, the present study validates Gujarati PSEQ with only VAS, unlike the other versions that compare with different Health Assessment Questionnaires.

Future study

Future studies should include a large sample size of patients with various MSDs. The Gujarati version

Table 1: Minor changes suggested by the expert committee

Item number	As mentioned in English PSEQ	As mentioned in Gujarati PSEQ	Changes made by expert committee
introduction	Despite of pain	દુખાવો	પીડા
Scale anchors	Not at all confident	સંપૂર્ણવશ્વિાસનથી	બીલકુલ
3	Socialize	સામાજકિરણ	હળવુંમળવું
10	Active	સક્રયિ	કાર્યશીલ

PSEQ: Pain Self-Efficacy Questionnaire

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of PSEQ can be validated with other quality of life questionnaires such as Pain Catastrophizing Scale, Medical Outcome Study Short-Form 36 (SF-36), and SF McGill Pain Questionnaire.

Conclusion

Gujarat is an Indian state where the majority of people communicate in Gujarati language. The translated version of PSEQ in Gujarati will help in objectively defining the self-efficacy beliefs and confidence of doing activities despite pain in patients with chronic pain of Gujarati population. The PSEQ Gujarati version is a valid and highly reliable scale and very easy to administer in clinical settings. The PSEQ Gujarati version can be also useful in various research purposes.

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2. Dr. Tarkin amin (orthopedic surgeon)
3. Dr. Nipa shah (PT) (senior physiotherapist)
4. Dr. Binal gajjar (PT) (senior physiotherapist)
5. Dr. Komal shah (PT) (senior physiotherapist).

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Conflicts of interest

There are no conflicts of interest.

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