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RESEARCH ARTICLE

# A VALIDATION STUDY ON THE PAIN BELIEFS QUESTIONNAIRE MALAY VERSION (PBQ-M) AMONG MALAYSIAN ADULTS

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## ABSTRACT

The biopsychosocial approach in chronic pain considers one's belief, cognition and behaviours related to the pain experience. To date, there is no measure for pain beliefs in Malaysia, highlighting the need for validation of the Pain Beliefs Questionnaire (PBQ). There were 125 participants in this cross-sectional study. The PBQ was first translated from English to Bahasa Malaysia and then back-translated by the team of researchers, reviewed and examined by third party clinical psychologists experienced in chronic pain management.

While all participants completed the PBQ, only those who reported having pain exceeding six months (n = 37) were required to complete the Pain Catastrophizing Scale (PCS) and the Pain Self-Efficacy Questionnaire (PSEQ). The organic subscale had a Cronbach's alpha coefficient of 0.81 while the psychological subscale had a coefficient of 0.71. Overall, the PBQ-M demonstrated good reliability (ICC = 0.81). The Organic subscale of the PBQ had a significant association with PCS, however, there were weak correlations between the organic (p = .058) and psychological (p = .077) subscales of PBQ with the PSEQ.

In conclusion, the PBQ-M is a valid and reliable measure of Malaysian adults' pain beliefs, independent of the presence of the condition, via two scales that can potentially predict pain catastrophizing and pain self-efficacy.

### KEYWORDS

Chronic pain, biopsychosocial, pain belief, pain catastrophizing, self-efficacy

## INTRODUCTION

Pain refers to the sensorial and emotional experience that is unpleasant related to or mimicking the relation with real or potential damage to the tissue [1]. Generally, it serves an adaptive and protective function. However, when pain becomes a chronic condition, these functions are no longer served. Instead, consequences are reflected socially, economically and clinically. Some examples can be seen in the struggles of individuals with chronic pain in terms of employment, financial management, companionship and mental health such as depression, anxiety and ultimately,

suicide [2]. The general prevalence of chronic pain in Malaysia is low but a recent study highlighted the increased prevalence of chronic pain across the aging population (21.5%) [3].

From the biomedical reductionist model, chronic pain management has taken a shift towards the biopsychosocial approach where pain is viewed as a result of the interactions among the physiological, psychological and social components [4]. This shift was due to criticisms towards sole biomedical treatments such as medications and surgeries which pose risk of medication abuse, misuse, and impairment on human functioning [5].

Patient's belief, cognition, and their associated behaviours are crucial underlying factors contributing to the understanding of the biopsychosocial perspective of chronic pain. An individual's belief towards pain contributes to the whole pain experience and responses. One meta-analysis indicated that disability had a moderate correlation with pain self-efficacy ($r = -.51$, $p<.001$), pain catastrophizing ($r=.44$, $p<.001$) and pain-related fear ($r=.41$, $p<.001$). A past study has found that a large proportion of pain beliefs had a medium effect size on disability and pain, when pooled together, indicating that individuals who possessed a higher pain self-efficacy, lower catastrophizing, pain-related fear and negative pain-related beliefs displayed lower disability [6]. The perception of pain as frightening contributes to disruption in daily functioning and encourages the engagement of safety behaviours such as pain avoidance [7]. Pain avoidance can be manifested in many ways, one of which is the fear of movement. Subsequently, individuals with high self-efficacy in their capacity to manage pain and accomplish an action can lessen this fear. While there is an indication for chronic pain to increase organic beliefs among individuals [8], a shift towards the psychological perspective led to decreased pain [9]. This implies that if pain beliefs are targeted, the daily functioning and management of pain can be improved.
The Pain Catastrophizing Scale (PCS) was developed to assess an individual's tendency to catastrophize in response to pain, influencing how pain is perceived. Items in the scale reflect 3 subscales: rumination, magnification, and helplessness. The PCS demonstrated high internal consistency ($\alpha = 0.87$) and construct validity [10]. Among 229 studies, PCS was found to have good internal reliability ($\alpha = 0.92$), test-retest reliability (Spearman $p = .88$) and strong correlations with participants' pain type, specifically those with generalized pain [11].

In Malaysia, the adaptations of Pain Catastrophizing Scale (PCS) and Brief Pain Inventory (BPI) are used to evaluate pain catastrophizing, intensity and interference [12,13]. However, there are currently no measures of pain beliefs in the country. One of the widely used tools for this purpose is the Pain Beliefs Questionnaire (PBQ). The PBQ was first established to assess individual's beliefs and attributions of the causes and effect of pain, and possible factors contributing to the experience of pain in the long run [14]. The PBQ was found to have good psychometric properties in other languages and in different ethnicities [15]. It has also been used in many countries to study pain beliefs and in deciding treatment options [16]. The study of PBQ has also extended to the association of pain beliefs with depression [17], disability [9], help seeking behaviour and helplessness [18]. Hence, to obtain a more comprehensive understanding of Malaysian chronic pain patients, a pain beliefs questionnaire that is adapted to the local context will be useful to explore individuals' perception of pain, as this may lead future research on the relationship between pain perception with daily living and coping.

## METHODOLOGY

### PARTICIPANTS

There were 125 participants who took part in this validation study. The sample size was determined using the 10:1, respondent-to-item ratio. As the PBQ consists of 12 items, a sample size of at least 120 participants was adequate. They were recruited through social media platforms and messaging service (i.e. Facebook, Instagram, WhatsApp), as well as hardcopy distribution at Hospital Selayang. Participants who were 18 years old and above, Malaysian, fluent in English or Bahasa Malaysia and provided consent to participate were included in the study as the general population. Individuals who reported having pain exceeding six months or was clinically diagnosed with chronic pain were considered chronic pain patients in this study and included in the stage 2 analysis.

### DESIGN

This was a cross-sectional study using a survey method.

### MEASURES

The pain beliefs questionnaire (PBQ) has a total of 12 items under Organic Beliefs Scale (8 items) and Psychological Beliefs Scale (4 items), rated across a Likert scale of 1 (Never) to 6 (Always). The Organic Beliefs Scale reflects the pain perception as organic while the Psychological Beliefs Scale reflects the interplay of psychological components in pain. The scale was found to have good construct validity and internal consistency (a = .70 to .73) [14].

The Pain Catastrophizing Scale (PCS) has 13 items across three subscales, Rumination, Helplessness and Magnification, that assesses individuals' pain-related catastrophizing thinking rated using a Likert scale of 0 (Not at all) to 4 (All the time). Higher scores on the PCS indicate a higher tendency for pain catastrophizing [19]. The translation and validation study of PCS in the Malaysian context found satisfactory internal consistency (a = .93) [12].

The Pain Self-Efficacy Questionnaire (PSEQ) has 10 items that measure an individual's belief about their functioning in the presence of pain across a Likert scale of 0 (Not confident at all) to 6 (Completely confident) [20]. Stronger beliefs related to self-efficacy are characterized by higher scores on the PSEQ. Although there is no published study on the validation of PSEQ in Malaysia, Hospital Selayang is using a Malay translated version that possesses good internal consistency (a = .95) [21].

### PROCEDURE

This study was conducted in accordance with the principles outlined in the Declaration of Helsinki and complies with the ethical standards of the university's ethics review committee which provided ethical clearance. Then, the PBQ was translated from English to Bahasa Malaysia by the primary researcher and subsequently, back-translated from Bahasa Malaysia to English by a secondary researcher. The translated versions of the PBQ were reviewed by a clinical psychologist bilingually, and the final version of the PBQ Bahasa Malaysia (PBQ-M) was reviewed by a panel which comprised of three clinical psychologists in pain management.

Participants were recruited in person during their hospital visit and via social media platforms. Informed consent was obtained before collecting participants' demographic information and their ratings on the PBQ, PCS and PSEQ via Qualtrics (for online respondents only). While all participants completed the PBQ, only those who had experienced pain exceeding six months were asked to complete the PCS and PSEQ.

### DATA ANALYSIS

Data analysis was done using SPSS version 26. Participants' socio-demographic information are presented via descriptive statistics, while factor analysis was used to assess the construct validity of PBQ-M. Firstly, normality was determined using histogram and QQ-plots. To determine whether factor analysis was appropriate to be conducted, Kaiser-Meyer-Olkin (KMO) statistics (> 0.7) and Bartlett's test of sphericity ($p < .05$) was done. Subsequently, principal components analysis (PCA) was conducted to reduce the dimensionality of datasets, hence allowing data interpretation with minimal loss of information. The internal consistency was further assessed using Cronbach's alpha while concurrent validity was assessed using Pearson's correlation between PBQ-M with PCS and PSEQ.

## RESULTS

### SAMPLE CHARACTERISTICS

Out of 175 responses, there was 50 missing data, resulting in a final total of 125 participants in this study. The mean age was 27.68 (SD = 10.69) with a majority of female (n = 77; 61.6%). The majority of respondents (n = 88; 70.4%) completed the PBQ-M only as they had pain of less than six months. Among the chronic pain participants (n = 37, 29.6%), two of them had missing data on PCS and PSEQ, resulting in only the analysis of their PBQ scores.

## CONFIRMATORY FACTOR ANALYSIS AND RELIABILITY

Factor analysis was conducted on all items from the PBQ. The PBQ scored well on the KMO (KMO = 0.81) with significance on the Bartlett's test of sphericity ($p < .001$). Such results indicate that sphericity is assumed, and factor analysis was suitable to be used to analyse the responses. Principle component analysis was conducted in a 2-factor model as two definite components was reflected by the scree plot (see Table 1). All items were kept due to strong loading (>0.40) on a single component. The total scale showed adequate Internal consistency (a = 0.81). Similar results were found for the organic subscale (a = 0.81), and the psychological subscale (a = 0.71).

**TABLE 1. COMPONENT LOADINGS OF 12-ITEMS IN PBQ**

| Items | Component 1 (Organic) | Component 2 (Psychological) |
|---|---|---|
| PBQ1: Damage to tissue | 0.55 | |
| PBQ2: Physical exercise | 0.77 | |
| PBQ3: Impossible alone to relieve pain | 0.62 | |
| PBQ4: Being anxious worsens pain | | 0.80 |
| PBQ5: Something wrong with body | 0.62 | |
| PBQ6: Coping when relaxed | | 0.50 |
| PBQ7: Prevents hobbies and social activities | 0.55 | |
| PBQ8: Pain related to amount of damage | 0.63 | |
| PBQ9: Thinking about pain | | 0.68 |
| PBQ10: Impossible to control pain | 0.72 | |
| PBQ11: Sign of illness | 0.65 | |
| PBQ12: Feeling depressed worsens pain | | 0.83 |

## CRITERION-RELATED VALIDITY

The Pearson's correlation was conducted on PBQ-Organic (PBQ-O), PBQ-Psychological (PBQ-P), PCS total and PSEQ (a = .05) (see Table 2). There was a significant association between PBQ-Organic and PCS. However, PSEQ was observed to have weak correlations with PBQ-Organic ($p = .058$) and PBQ-Psychological ($p = .077$).

**TABLE 2. PEARSON CORRELATION BETWEEN PBQ-O, PBQ-P, PCS, AND PSEQ**

| | PBQ-Org | PBQ-Psy | PCS | PSEQ |
|---|---|---|---|---|
| PBQ-Org | 1 | | | |
| PBQ-Psy | -0.07 | 1 | | |
| PCS | 0.40 ** | -0.05 | 1 | |
| PSEQ | -0.33* | 0.31* | -0.07 | 1 |

*Note.* ** represents significant correlation at the 0.05 level (2-tailed). PBQ-Org = Pain Beliefs Questionnaire-Organic. PBQ-Psy = Pain Beliefs Questionnaire-Psychological. PCS = Pain Catastrophizing Scale. PSEQ = Pain Self-Efficacy Questionnaire.

## DISCUSSION

The goal of this research was to translate and evaluate the validity of the Pain Beliefs Questionnaire (PBQ) in the Malaysian context. The findings on the validity (p = .058, .077) and reliability (α = 0.71, 0.81) of the PBQ in this study are consistent with previous reports [8, 14]. Confirmatory factor analysis showed that 2-factor was the best model for the PBQ-M, where it demonstrated similarity with the initial findings by a previous study [14]. All item loading were strong with no cross loading in the 2-factor model. The PBQ-M therefore, can be characterized by two sub-scales: Organic, dealing with individual's perception on the cause of pain and its management, and Psychological, dealing with the impact of factors such as anxiety, depression, attention to pain and relaxation. Similar to the original findings [14], the total scores and individual sub-scales of the PBQ-M demonstrated acceptable internal consistency. These findings suggest that PBQ-M is valid and reliable to be used among the Malaysian adult population.

Apart from that, organic pain beliefs significantly correlate with pain catastrophizing in this study. This is consistent with previous studies on the association between negative metacognitive beliefs with pain catastrophizing [22]. Similarly, pain catastrophizing was found to be correlated with the belief that social support is low and perceived poor self-coping abilities [23]. Such findings highlight the contribution of metacognitive beliefs in understanding pain and its impact on functioning. Organic beliefs may lead to the idea that pain has a biological basis and can only be treated by external variables (e.g., doctors, medicine, surgery), thus contributing to the reduced sense of control associated with increased pain catastrophizing. Further evidence is reflected by the schema-activation model, which proposes that pain catastrophizing is characterised by a pain schema consisting of excessive pessimistic beliefs about pain, its experience and one's coping ability [24]. This schema is activated in the presence of a minimally noxious stimulus, and heightens the pain experience, which translates into a self-fulfilling prophecy that pain is threatening and cannot be self-managed. Nevertheless, this model failed to address the conditions and dynamics that lead to schema activation.

In contrast to organic beliefs and previous findings on anxiety with pain catastrophizing [25], no significant association was found between psychological pain beliefs and pain catastrophizing in this study. This finding may be explained by the lack of education among Malaysians on the other aspects of pain, where many still hold on to the biomedical perspective. It seemed that Malaysians are still skeptical of mental health care due to its stigma, as evidenced by varying findings on pain beliefs and catastrophizing across different countries [26]. This may be due to the reduced accessibility and exposure towards mental health affected by socioeconomic status, education and culture.

The findings on the negative association between organic pain beliefs with pain self-efficacy, and the positive association between psychological pain beliefs with pain self-efficacy, is consistent with a previous study where chronic low back pain individuals with organic pain beliefs felt less in control of pain, leading to lower self-efficacy and greater disability, anxiety and depression [17]. The direction of association between pain beliefs with self-efficacy, or lowered self-efficacy scores with passive coping (reliance on medication) is also supported by previous studies on individuals with low back pain who had poor self-efficacy with higher drug use [27] and, the engagement in active coping and higher self-efficacy with lesser drug use [28]. There is strong evidence in literature to support these findings whereby patients with musculoskeletal disorders who reported higher pain self-efficacy had better outcomes in terms of ability to function, interference of pain, anxiety and depression [29].

To date, there are very few studies in Malaysia which focuses on the psychological aspect of pain as it is perceived to be a rather new perspective. Within this perspective, some critics may argue that the contextualisation of pain is difficult as psychological beliefs vary across individuals, more so between chronic and non-chronic pain individuals [8]. This suggests that apart from pain itself, its severity may have a unique influence on an individual's psychological belief towards it. Self-efficacy refers to an individual's belief in their own capacity to perform behaviours for attainment [30], which can explain the association between beliefs and self-efficacy in the pain context. Self-efficacy is also characterised by an individual's confidence in their ability to control areas such as motivation, behaviour, and social environment. All these play a role in influencing an individual's experience, including goals in life, expansion of effort and the possibility of achieving a certain

level of behavioural performance. Due to its influence on the direction of an individual's experience, pain self-efficacy is regarded as one of the most influential and valuable constructs within the psychological perspective for individuals with chronic low back pain [31]. It is, therefore, worthwhile for future research to explore this construct with clinical implications. There are, however, a few limitations in this study. Findings from this study resulted from cross-sectional design, hence a causal relationship cannot be established. The sample size in this study was reasonable for psychometric testing but participants with chronic pain, in particular, was relatively small (n = 37). Although the sample size was sufficient to be analysed using Pearson's correlation, results generated from small sample sizes may not accurately resemble that of the true population, thus affecting data generalization. Similarly, missing data from the participants were excluded from the results which may incur selection bias, hence not adequately representing the population. Therefore, future studies may be conducted with a larger sample size of chronic pain patients. As chronic pain may be more prevalent among the older population [3], there is a limitation in our findings where samples were collected from a relatively young age group. In view of recruiting the older population, it is also important to consider physical recruitment as the technological accessibility and literacy among the older population may be lacking.

Findings from this study indicated that the PBQ-M is suitable to measure pain beliefs among Malaysians. To further enhance the value of PBQ-M, future studies may consider using confirmatory factor analysis and study its predictive validity. There is potential for the PBQ to have clinical benefit as the understanding of an individual's pain belief would facilitate a more tailored pain management intervention and/or treatment program. Overall, recognising the impact of organic and psychological beliefs on an individual's pain perception is important as it allows a better delivery of care towards chronic pain patients and a more effective pain management.

## CONCLUSION

In conclusion, the PBQ-M is valid and reliable to be used among Malaysian chronic pain samples. The questionnaire also poses potential benefits in terms of research and practice, as it emphasises clinically relevant beliefs that are both central and malleable. The significance of pain beliefs has been highlighted in this study. This is an important step in the rehabilitation of chronic pain as addressing the beliefs about the nature, origin and treatment of pain improves the "biomedical" perspective of pain. Lastly, the PBQ-M is a simple measure that is independent of the condition or presence of pain yet demonstrates good potential in predicting pain catastrophizing and pain self-efficacy.

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