

RELIABILITY, VALIDITY AND AGREEMENT OF THE THAI SELF-REPORTED FIBROMYALGIA SURVEY QUESTIONNAIRE AMONG PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN

Nutta Wongthanavimok, Chalermpong Chewachutirungruang, Chanasak Hathaiareerug, Chanwit Phongamwong

Department of Rehabilitation Medicine, Phramongkutklao Hospital and Phramongkutklao College of Medicine, Bangkok, Thailand

Abstract

Background: Fibromyalgia (FM) diagnosis is typically based on the American College of Rheumatology (ACR) criteria, relying on patient-reported symptoms. The Thai self-reported Fibromyalgia Survey Questionnaire (FSQ) was developed based on the 2016 version of the ACR criteria set.

Objectives: This study aimed to evaluate the internal consistency, convergent validity and agreement of the self-reported FSQ compared with the telephone interview of a physician among patients with chronic musculoskeletal pain.

Methods: The Thai FSQ consisting of 25 questions: 19 for widespread pain index (WPI) and 6 for symptom severity scale (SSS), was developed by three Thai physiatrists. The fibromyalgia severity (FS) scale (the sum of WPI and SSS: 0-31) of 13 or more was used to diagnose fibromyalgia. All participants completed a self-reported paper research questionnaire in a private room. Then 24-48 hours later, participants underwent a telephone interview with the Thai FSQ. The internal consistency and convergent validity of the Thai self-reported FSQ were assessed using Cronbach's alpha and Pearson's correlation, respectively. The agreement between the Thai self-reported FSQ (FS scale ≥ 13) and the telephone interview using the 2016 ACR criteria for diagnosing fibromyalgia was evaluated using Cohen's kappa.

Results: Of 89 participants, the majority were females (66.3%) with a mean age of 53.5 ± 15.9 years and had an educational level of bachelor's degree or higher (79.7%). Cronbach's alpha was 0.82, while the correlation between the FS scale and EQ-5D-5L utility was -0.48 ($p < 0.001$). Cohen's kappa for diagnosis agreement was 0.55 ($p < 0.001$).

Conclusion: The Thai self-reported FSQ exhibited good internal consistency and moderate construct validity. The diagnostic agreement of the Thai self-reported FSQ with the telephone interview was moderate. Although this questionnaire could be used as a screening tool, physicians would need to confirm the diagnosis of fibromyalgia.

Keywords: Fibromyalgia, Questionnaire, Reliability, Validity, Agreement

J Southeast Asian Med Res 2023; 7:e0172

<https://doi.org/10.55374/jseamed.v7.172>

Correspondence to:

Phongamwong C, Department of Rehabilitation Medicine, Phramongkutklao Hospital and Phramongkutklao College of Medicine, Bangkok 10400, Thailand.

E-mail: chanwit.p@pcm.ac.th

Received: 3 May 2023

Revised: 17 June 2023

Accepted: 24 June 2023

Introduction

Fibromyalgia (FM) is characterized by widespread chronic pain, general hypersensitivity, insomnia, fatigue, cognitive problems, anxiety and depression.⁽¹⁾ The prevalence of FM varies depending on the definition and criteria used for diagnosis, as well as the demographic characteristics of the population studied. The study of Prateepavanich et al. in Thailand reported that the prevalence of FM was 25.7% among 70 patients with chronic myofascial pain syndrome.⁽²⁾ The etiology of FM is not clearly understood; however, current scientific evidence suggests that nociceptive alterations including central and peripheral sensitization and a reduction in endogenous pain inhibitory signals may contribute to the pathophysiology of FM.⁽³⁾ Diagnosing FM remains a challenge due to the absence of specific laboratory or imaging tests. As a result, diagnosis is primarily based on clinical symptoms.

Fibromyalgia (FM) diagnosis is typically based on the American College of Rheumatology (ACR) criteria, which have evolved over time. The 2010 version of the ACR criteria included two components: the Widespread Pain Index (WPI), assessing the number of pain sites (range 0 to 19), and the Symptom Severity Scale (SSS) score (range 0 to 12). FM was diagnosed when the following three criteria were met: (1) a WPI ≥ 7 and an SSS score ≥ 5 or a WPI of 3-6 plus an SSS score ≥ 9 ; (2) the symptoms had been present for at least three months and (3) the symptoms were not attributable to other diseases.⁽¹⁾ In 2011, the ACR criteria were revised to include the number of symptoms present during the last six months including headache, lower abdominal cramps or pain and depression, instead of general somatic symptoms. In addition, the Fibromyalgia Severity (FS) scale, the sum of the WPI and SSS, was introduced for FM diagnosis when it reached ≥ 13 .⁽⁴⁾ Most recently, the 2016 version of the ACR diagnostic criteria added generalized pain, defined as pain in at least four of five regions (axial, right/left upper extremities and right/left lower extremities), to the diagnostic criteria.⁽⁵⁾

The ACR diagnosis for FM relies on patient-reported symptoms. Given that the ACR

criteria do not require physical examinations; thus, the patient could self-assess their symptoms for a potential diagnosis of FM. Regarding this, several countries such as Iran, German, Brazil and Italy have developed self-reported fibromyalgia survey questionnaires (FSQ) in their language.⁽⁶⁻⁹⁾ Currently, the FSQ is unavailable in Thai. Therefore, the present study aimed to develop a Thai version of the self-reported FSQ and to evaluate its internal consistency and construct validity. Furthermore, agreement for FM diagnosis between the Thai self-reported FSQ and telephone interview by a physician was assessed.

Methods

Study design and participants

This cross-sectional study was approved by the Institutional Review Board of the Royal Thai Army Medical Department (IRB number: R155h/64). Eligible participants were enrolled prospectively at the Department of Rehabilitation Medicine, Phramongkutklo Hospital in Bangkok, Thailand, from March 2022 to October 2022. All participants were informed, and written consent was obtained before participating in this study. Eligible criteria included patients with chronic musculoskeletal pain aged at least 20 years. Patients who could not read questionnaires due to illiteracy or visual impairments, those who were pregnant, and those with psychiatric disorders were excluded.

Questionnaire

The Thai FSQ was developed by three Thai psychiatrists with five to ten years of experience diagnosing fibromyalgia and had upper-intermediate English skills (IELTS score of 6.5 or equivalent). The development of the Thai FSQ was based on discussions among the three psychiatrists on how they interview patients to diagnose FM in their clinical practice using the 2016 ACR criteria.

The research questionnaire consists of four parts: (1) general information, (2) Thai FSQ consisting of 19 questions for WPI and six questions for SSS (**Supplementary Material**), (3) understanding of the Thai FSQ using the

5-likert scale (**Table 1**) and (4) Thai EQ-5D-5L to calculate health utility ranging from 0 (the worst) to 1 (the best).⁽¹⁰⁾ The survey consisted of two stages: first, participants completed a self-administered paper research questionnaire in a private room. The second stage occurred 24 to 48 hours later, wherein participants joined a telephone interview with the Thai FSQ.

Statistical analysis

The sample size was calculated based on a power of 0.90, and the probability of type I error was set at 0.05. The number of items or raters (k) = 26. The value of Cronbach's alpha at null hypothesis ($CA0$) = 0.5, and the expected value of Cronbach's alpha ($CA1$) = 0.7. The internal consistency of the Thai SEQ was evaluated using Cronbach's alpha. Construct (convergent) validity was determined using Pearson's correlations between the sum of the WPI+SSS, known as the Fibromyalgia severity (FS) scale and the health utility of EQ-5D-5L. The diagnostic agreement between the Thai FSQ (FS scale ≥ 13) and the telephone interview of a physician (the 2016 ACR criteria) was evaluated using Cohen's kappa. A p -value less than 0.05 was considered statistically significant. Additionally, the sensitivity and specificity of Thai FSQ for FM diagnosis were

calculated using the physician's telephone interview as the gold standard.

Results

Eighty-nine eligible patients (30 males and 59 females) participated in this study. As shown in Table 1, the mean age of the participants was 53.5 ± 15.9 years. For educational levels, 79.7% had bachelor's degrees or higher. Approximately 87% had almost entirely or an entire understanding of the Thai FSQ. The overall Cronbach's alpha of the Thai FSQ was 0.82, indicating good internal consistency. Convergent validity calculated by Pearson's correlations showed a moderate negative correlation between the FS scale and the health utility of EQ-5D-5L ($r = -0.48, p < 0.001$) (**Figure 1**). The agreement on the diagnosis of fibromyalgia between self-administration and telephone interview by a physician revealed moderate agreement (Percent agreement 83.2%, Cohen's kappa=0.55, $p < 0.001$). Based on the physician telephone interview, 22.5% (95% confidence interval [CI]: 14.3% to 32.5%) received a diagnosis of FM. The sensitivity and specificity of the Thai FSQ were 75% (95%CI: 50.9% to 91.3%) and 85.5% (95%CI: 75% to 92.8%), respectively, as reported in **Table 2**.

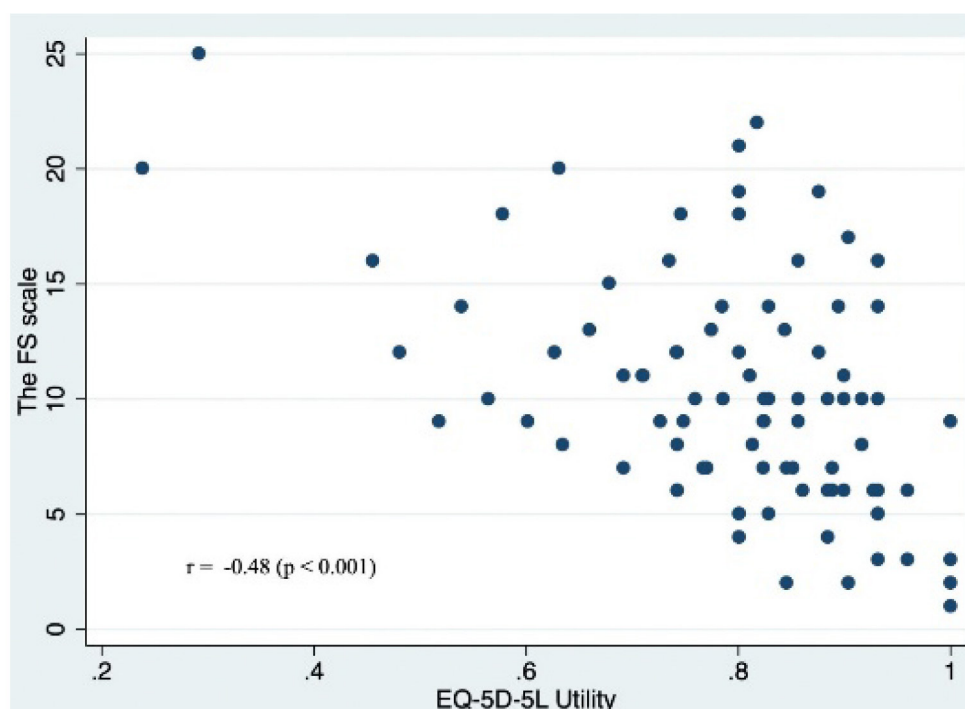


Figure 1. Pearson's correlations between the FS and health utility of EQ-5D-5L

Table 1. Demographic data of participants

Characteristics	
Sex, Female ²	56 (63%)
Age (years) ¹	53.5 (15.9)
Educational level ²	
Higher than bachelor's or equivalent	22 (24.7%)
Bachelor's or equivalent	49 (55%)
Secondary	14 (15.7%)
Primary	2 (2.3%)
Pre-primary	2 (2.3%)
Understanding of the Thai FSQ ²	
Completely understand	61 (68.5%)
Almost completely understand	16 (18%)
Partially understand	10 (11.2%)
Almost completely do not understand	1 (1.1%)
Completely do not understand	1 (1.1%)

¹ Mean (SD), ² number (%)

Table 2. Agreement of the FM diagnosis between self-administration and telephone interview

FS scale \geq 13 (Self-administration)	ACR 2016 diagnostic criteria (Telephone interview)		Total
	Yes	No	
Yes	15 (60%, 75%)	10 (40%, 14.5%)	25 (100%, 28.1%)
No	5 (7.8%, 25%)	59 (92.2%, 85.5%)	64 (100%, 71.9%)
Total	20 (22.5%, 100%)	69 (77.5%, 100%)	89 (100%, 100%)

Values are presented as number (row percentage, column percentage)

FM: Fibromyalgia; ACR: American college of rheumatology; FS: Fibromyalgia severity

Discussion

To our knowledge, this study was the first to develop the FSQ in Thai version. The results showed that the Thai FSQ exhibited good internal consistency. The overall Cronbach alpha of Thai FSQ was 0.82, which was slightly higher than the German (0.71), Brazilian (0.74), and Italian (0.71) Versions.⁽⁷⁻⁹⁾ The convergent validity of Thai FSQ with EQ-5D-5L utility was moderate ($r = -0.48, p < 0.001$), similar to the German Version that showed a moderate degree of convergent construct validity with PHQ-4 ($r = 0.48, p < 0.001$).⁽⁸⁾ Furthermore, the diagnosis

agreement for FM of the Thai FSQ with the telephone interview was moderate, with Cohen's kappa=0.55, which was lower than the Italian Version, Cohen's kappa=0.65.⁽⁹⁾ One possible explanation was that the present study used different diagnosis criteria between the Thai FSQ (FS scale \geq 13) and the physician telephone interview (2016 ACR criteria).

Additionally, based on the 2011 ACR criteria, the FS scale \geq 13 showed a sensitivity of 96.6% and a specificity of 91.8% in the diagnosis of FM.⁽⁴⁾ The present study found that the FS scale \geq 13 revealed a lower sensitivity and specificity

when the 2016 ACR criteria were used as a gold standard for diagnosing FM. This might have been due to the addition of generalized pain in the diagnostic criteria of the 2016 Version.

Several limitations should be considered when interpreting the findings of this study. First, no other specialists with experience in FM diagnosis such as rheumatologists participated or collaborated in developing the Thai FSQ. Second, most participants in this study had attained a high level of education (bachelor's degree or higher), potentially limiting the generalizability of the results to individuals with lower educational backgrounds. The present study was conducted solely in Bangkok, Thailand's capital; thus, the findings may only represent part of the country. Moreover, the sample size was not estimated to determine the diagnostic properties of the Thai FSQ, which may have implications regarding the precision of the results. Lastly, the test-retest reliability of the Thai FSQ was not assessed in this study.

Conclusion

The Thai FSQ showed good internal consistency, moderate construct validity and moderate agreement with the diagnosis of physicians. Therefore, the Thai FSQ may be used as a primary survey to evaluate fibromyalgia among patients with chronic pain.

Supplemental material

Supplemental material for this article is available online.

Disclosure

The authors have no conflicts of interest to declare.

Acknowledgments

The present study was supported by the Phramongkutklao Research Fund. Additionally, the authors would like to thank all staff and participants contributing to the successful completion of the study.

References

1. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, et al. The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. *Arthritis Care Res (Hoboken)* 2010; 62: 600-10.
2. Prateepavanich P, Kattinanon D, Suwannakin A. The Prevalence of Fibromyalgia in Chronic Myofascial Pain Syndrome Patients. *J Thai Rehabil Med* 2017; 27: 71-6.
3. Sarzi-Puttini P, Giorgi V, Marotto D, Atzeni F. Fibromyalgia: an update on clinical characteristics, aetiopathogenesis and treatment. *Nat Rev Rheumatol* 2020; 16: 645-60.
4. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Hauser W, Katz RS, et al. Fibromyalgia criteria and severity scales for clinical and epidemiological studies: a modification of the ACR Preliminary Diagnostic Criteria for Fibromyalgia. *J Rheumatol* 2011; 38: 1113-22.
5. Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Hauser W, Katz RL, et al. Revisions to the 2010/2011 fibromyalgia diagnostic criteria. *Semin Arthritis Rheum.* 2016; 46: 319-29.
6. Bidari A, Ghavidel-Parsa B, Amir Maafi A, Montazeri A, Ghalehbaghi B, Hassankhani A, et al. Validation of fibromyalgia survey questionnaire and polysymptomatic distress scale in a Persian population. *Rheumatol Int* 2015; 35: 2013-9.
7. Daltrozo JB, Paupitz JA, Neves FS. Validity of the fibromyalgia survey questionnaire (2016) assessed by telephone interview and cross-cultural adaptation to Brazilian Portuguese language. *Adv Rheumatol* 2020; 60 :37.
8. Hauser W, Jung E, Erbsloh-Moller B, Gesmann M, Kuhn-Becker H, Petermann F, et al. Validation of the Fibromyalgia Survey Questionnaire within a cross-sectional survey. *PLoS One* 2012; 7: e37504.
9. Varallo G, Ghiggia A, Arreghini M, Capodaglio P, Manzoni GM, Giusti EM, et al. The Reliability and Agreement of the Fibromyalgia Survey Questionnaire in an Italian Sample of Obese Patients. *Front Psychol* 2021; 12: 623183.
10. Pattanaphesaj J, Thavorncharoensap M, Ramos-Goni JM, Tongsiri S, Ingsrisawang L, Teerawattananon Y. The EQ-5D-5L Valuation study in Thailand. *Expert Rev Pharmacoecon Outcomes Res* 2018; 18: 551-8.