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ORIGINAL RESEARCH

Translation, Cross-Cultural Adaptation, and Psychometric Properties of the Revised Fibromyalgia Impact Questionnaire (FIQR) for Use in Arabic-Speaking Patients in Saudi Arabia

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Background/Aim: Fibromyalgia (FM) is a complex and debilitating condition that significantly impacts patients' daily lives. The continuous assessment of the impact and severity of FM is essential to manage the condition effectively. Assessment tools in Arabic are lacking for use in Saudi Arabia, which might lead to ineffective management. This study aimed to translate and cross-culturally adapt and validate the Arabic version of the Revised Fibromyalgia Impact Questionnaire (FIQR).

Methods: Following translation guidelines, 2 Arabic translators and 2 English-certified translators performed forward and backward translations of the FIQR. In a cross-sectional study design, the questionnaire was piloted with 5 participants and then subjected to cognitive interviews and psychometric analysis. Participants were FM patients recruited from a University Hospital in Riyadh and FM support groups in Saudi Arabia. The internal consistency, and reliability using the Cronbach α and interclass correlation coefficient (ICC) of 2-week test–retest, and criterion validity were evaluated.

Results: The results included a total of 42 participants with FM. Six minor modifications were made during the stepwise translation of the questionnaire. The Arabic version of the FIQR had good internal consistency and test–retest reliability, with a Cronbach α of 0.855 for the physical functioning domain, 0.663 for overall well-being, 0.803 for symptoms, and 0.895 for the total FIQR, and the Pearson correlation coefficient of the ICC for physical functioning was 0.769 (95% confidence interval (CI), 0.541–0.884) for the overall well-being domain, 0.555 (95% CI, 0.129–0.772) for the symptoms domain, and 0.720 (95% CI, 0.370–0.868) and 0.794 (95% CI, 0.579–0.899) for the total FIQR score ($p < 0.001$), respectively.

Conclusion: The Arabic version of the FIQR is a valid, reliable, and practical tool for assessing the impact of FM on Arabic-speaking patients and potentially contributing to the improvement of FM outcomes.

Keywords: translation, cross-cultural adaptation, validation, validation studies, fibromyalgia, Arabic

Introduction

Fibromyalgia (FM) is a chronic complex disorder characterized by widespread pain, fatigue, sleep disturbances, and cognitive dysfunction, affecting both the physical and mental well-being of patients who have no other reasons for pain lasting at least 3 months.[1,2] FM affects millions of people worldwide, and the global prevalence of FM ranges from 0.4% to 9.3% among the general population, with more women affected than men.[3] A systematic review found that FM affects 13.4% of the Saudi population.[4]

Due to the debilitating nature of FM, it can significantly impair patients' quality of life and work productivity,[5,6] and it imposes a considerable economic, personal, and social burden.[7–9] In daily clinical practice, continuous assessment of the impact and severity of FM on patients is crucial for evaluating patients' status and treatment outcomes. Moreover,

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accurate assessment is key to guiding clinical decision-making and understanding the disorder's burden on patients and healthcare systems. The Fibromyalgia Impact Questionnaire (FIQ) is a condition-specific, self-reported instrument translated into more than 14 languages, and more than 300 research papers use it to assess the health status of patients with FM.[10] In 2009, Bennett et al introduced a revised version of the FIQ (FIQR) that overcomes the limitations of the FIQ and has a more comprehensive assessment of FM's impact. According to the Outcomes Measures in Rheumatoid Arthritis Clinical Trials (OMERACT) domains that should be assessed in FM trials, the FIQR is a patient-reported outcome measure (PROM) that covers the core and most of the peripheral domains that should be assessed in FM trials.[11] A systematic review published in 2023 found that 81.9% of 107 FM trials applied both versions of the FIQ as outcomes measures.[12] The revised version is strongly associated with the original FIQ and has excellent psychometric properties (Cronbach $\alpha = 0.95$) and good convergent and discriminant validity,[13] and it distinguishes FM patients from patients with rheumatoid arthritis, systemic lupus erythematosus, and major depressive disorders.[13] The FIQR encompasses 3 domains: physical functioning, overall impact, and symptoms.[13] FIQR scores are used to assess the severity of FM, track changes in symptoms over time, and evaluate treatment effectiveness. The instrument has been translated and validated into several languages, such as Italian, Spanish, Chinese, Turkish, and Moroccan,[14–18] demonstrating good cross-cultural adaptation and validity.[19]

In Saudi Arabia, recognition of the prevalence and impact of FM among the population has increased.[20] However, a scarcity of validated tools to assess the impact of FM in this population may potentially hinder the effective management of FM patients in the region. To address this gap, the present study aims to translate the FIQR into Arabic and evaluate its cross-cultural adaptation, reliability, and validity among Arabic-speaking patients with FM in Saudi Arabia.

Methods

This research is a cross-sectional translation and psychometric validation study. The psychometric evaluation of the FIQR is reported according to the COnsensus-based Standards for the selection of health status Measurement of Instruments (COSMIN) guidelines.[21]

Ethical Approvals and Permissions

Arabic was the target language for translating the FIQR. A systematic and rigorous approach was adopted to ensure linguistic equivalence and cultural relevance following Mapi's linguistic validation manual and Beaton et al.[22,23] Permission was obtained through the Mapi Institute. Approval was granted from King Saud University and Medical City Institutional Review Board prior to conducting the translation and validation process (approval number E-21-5885). The study complies with the Declaration of Helsinki.[24] All participants involved in the study provided informed consent upon first contact.

Questionnaire Items and Study Tools (Measurements)

The tool was a short, self-administered questionnaire consisting of the FIQR and demographic data. The FIQR comprises 21 items covering different aspects of a person's experience with FM.[13] These questions are divided into 3 subscales or domains, each focusing on specific aspects of FM's impact. Physical functioning (Domain 1) consists of 9 questions and assesses a person's ability to perform daily activities, including tasks related to physical functioning, such as lifting, carrying, and walking. Overall impact (Domain 2) evaluates the overall impact of FM on a person's well-being through 2 questions that include symptoms like fatigue, stiffness, and depression. The symptoms (Domain 3) section assesses the severity and impact of 10 specific symptoms, including pain, sleep disturbances, and tenderness. Each item on the FIQR is scored on a numerical scale, typically ranging from 0 to 10, in which higher scores indicate greater impairment or severity.[13] Scores from the 3 subscales are combined to calculate a total FIQR score, which can range from 0 to 100. A higher total score indicates a more significant impact of FM.

To ensure comprehensive assessment alongside the FIQR, the Arabic Fibromyalgia Rapid Screening Tool (FiRST) was administered to participants. FiRST was the only available tool that is translated and validated in Arabic for Saudi Arabia.[25] Demographic data were also collected, including age, sex, marital status, education level, body mass index (BMI), years since the start of FM symptoms and first diagnosis, family history of FM, any previous medical history of trauma before the FM occurrence, and vitamin D, B12, or ferritin deficiencies.

Steps of Translation

Step I, Forward Translation

Two independent, professional translators fluent in English and Arabic were selected to forward-translate the tool into the target Arabic language (NAK and SHA).[26] These translators are experts in medical and healthcare terminology and hold postgraduate degrees in pharmacy. The first translator was aware of the concepts being examined in the questionnaire, whereas the other had no prior knowledge about the instrument and the trial. Each translator independently translated the FIQR from English into Arabic, resulting in 2 separate initial translations (T1 by NAK and T2 by SHA). A pooled version (FT) was produced by a committee of both translators and the local coordinator (SSA) after reaching a consensus.

Step II, Backward Translation of FIQR to the Source Language

The pooled translation of Step I (FT) was sent to a separate pair of bilingual translators whose first language is English and are fluent in Arabic but have no prior knowledge of the original FIQR to translate the pooled Arabic version (FT) back into English (BT). The local coordinator (SSA) then revised the (FT) and (BT) versions for content and cultural relevance. Otherwise, the questionnaire was translated efficiently without modifications required. After revising and discussing with the translators and expert committee comprised of the research team and a linguistic expert, the required modifications were applied, producing the pre-final version (PF) of the FIQR in Arabic.

Step III- Cognitive Interviews

The PF version of the Arabic FIQR was administered to a small group of Arabic-speaking participants with FM (5 participants). Cognitive debriefing interviews were conducted with these participants to identify any linguistic or cultural issues. Participants were asked for feedback on the clarity and relevance of the items. The final version of the translated FIQR in Arabic incorporated their feedback. Major edits were applied when any word in the questionnaire was changed to represent a more suitable cultural term or wording. Minor edits indicated the use of synonyms. The final FIQR was reviewed by an Arabic language expert to check for spelling, grammar, punctuation, and typography. This process ensured the final Arabic version of FIQR was culturally appropriate and linguistically accurate.

Participants and Recruitment

Adult participants (18 years or older) from both genders with a diagnosis of FM and the ability to read and write were eligible for recruitment and inclusion to the study. Patients younger than 18 years old, unable to read and write, or without a confirmed FM diagnosis were excluded. The study settings included FM support groups through social media (WhatsApp and Twitter) and specialized rheumatology clinics at King Saud University and Medical City in Riyadh, Saudi Arabia. For the FM support groups, an invitation link was sent through social media platforms, and potential participants completed a short survey to ensure they were diagnosed with FM by a consultant rheumatologist or pain consultant. If they had received a diagnosis, they provided their preferred time to conduct a Zoom interview with the research team. In the clinic, potential participants with a confirmed FM diagnosis were invited to participate and, upon agreement, a Zoom meeting was scheduled for detailed assessment. After consent and during the Zoom interview, participants were sent a copy of the tool and provided feedback during the meeting. If any clarification was needed, they notified the research team. All participants were asked to be interviewed twice after an interval of 2 weeks for an assessment of within-subject reliability.

Statistical Analysis, Psychometric Properties, and Reliability

Data were coded and entered into IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY.[27] According to normal distribution, data were presented as a mean and standard deviation (SD) or median and interquartile range (IQR). Categorical data were presented as both number and percent. FIQR domains were computed (Domain 1: 9 function items combined and divided by 3, Domain 2: 2 overall assessment items were summed, Domain 3: 10 symptom items were summed and divided by 2, then the total FIQR was computed by combining the 3 calculated domains scores).[13]

For psychometric properties, the terminologies used were aligned with COSMIN taxonomy.[28] The internal consistency and reliability were calculated using the Cronbach α and test–retest interclass correlation coefficient (ICC) with related 95%

confidence interval (95% CI), respectively. The standard error of the mean (SEM) and the minimal detectable change (MDC) were also examined. To evaluate the criterion validity further, the score of the symptom domain was correlated with FiRST items using the Pearson and Spearman correlation. Moreover, the radar chart was used to visualizes the average values that reflect the sensitivity of participants to various aspects of FM and to examine the presence of the floor or ceiling effect using a cutoff point of 5 for the average high and low values. Significance level was considered at p value of < 0.05.

Results

Demographic Characteristics

A total of 42 participants underwent cognitive interviews with no declines, and 37 (88.1%) patients agreed to be contacted and underwent the retest application. Participants were mostly female (n = 38, 90.5%), with a mean (SD) age of 46 years (13) and a mean (SD) BMI of 29.8 (5.4) kg/m2 (Table 1). No missing data were observed.

Results for Translation Steps

Forward Translation

In this step, 6 minor linguistic modifications were applied to the FIQR. The word *moth'qal* or "overwhelmed" has many translations in Arabic. We added another word between the brackets, *mon'hk*, to increase the reader's understanding. Also, the word "tenderness" has 2 meanings in Arabic; we chose the most common meaning in the daily clinical practice, *mo'elem end allams*, which means "painful to touch."

Table 1 Demographic Characteristics of Participants (N=42)

Demographic Characteristic		**Value**
Age, years	Mean (SD)	46 (13)
BMI, Kg/m^2	Mean (SD)	29.8 (5.4)
Gender	Male, n (%)	4 (9.5)
	Female, n (%)	38 (90.5)
Marital status	Unmarried, n (%)	16 (41.0)
	Married, n (%)	23 (59.0)
Years since first diagnosis of FM	Median (IQR)	5.0 (4.0–10.0)
Years since first symptoms of FM	Median (IQR)	8.5 (4.0–13.0)
Education	High school degree and below, n (%)	20 (48.8)
	University degree and higher education, n (%)	21 (51.2)
Family history	n (%)	9 (23.7)
Trauma history	n (%)	26 (68.4)
Vitamin D deficiency	n (%)	38 (92.7)
Vitamin B12 deficiency	n (%)	17 (41.5)
Iron deficiency	n (%)	23 (56.1)
Retest	n (%)	37 (88.1)

Abbreviations: BMI: Body Mass Index, FM: Fibromyalgia, IQR: interquartile range, SD: standard deviation.

Backward Translation

In this step, the coordinator revised the 2 backward-translated versions and contacted the translators with any discrepancies. No major discrepancies were found when compared to the original tool. The majority of discrepancies related to missing words in the backward versions, and this issue was resolved through discussion with the translators.

Piloting, Cognitive Interviews, and Proofreading

The PF survey was piloted with 5 participants, followed by cognitive interviews (n = 42). To enhance clarity in the checkbox section, 3 investigators agreed to add a number above each box. The investigators agreed to add the word *aghrad*, meaning "items", to the sentence "Go shopping for groceries" and "Lift and carry a bag full of groceries". For the item "Change bed sheets", we added *malaát* between brackets for extra clarification. After this step, minor grammatical changes were applied to the questionnaire during the proofreading. These refinements in the questionnaire reflected careful consideration of feedback and linguistic precision. The pilot sample was included after the cognitive interviews, and no changes were recommended as participants answered the questionnaire smoothly. Thereafter, the questionnaire was subjected to a psychometric analysis.

The final version FIQR can be obtained with permission from the MAPI Research Trust, Lyon, France. Email: PRO information@mapi-trust.org; http://www.mapi-trust.org (accessed on October 10, 2023).

Psychometric Properties

For the psychometric property of the survey, the internal consistency was reasonable for different parts of the survey with a Cronbach α of 0.855 for Domain 1, 0.663 for Domain 2, 0.803 for Domain 3, and 0.895 for the total FIQR score. For reliability testing, the ICC for Domain 1 was 0.769 (95% CI, 0.541–0.884), 0.555 (95% CI, 0.129–0.772) for Domain 2, 0.720 (95% CI, 0.370–0.868) for Domain 3, and 0.794 (95% CI, 0.579–0.899) for the total FIQR score. All were statistically significant. For criterion validity, the symptom domain of FIQR significantly correlated with the total FiRST score with a correlation coefficient of 0.364, $p = 0.018$ (Table 2).

Table 2 Psychometric Properties of the FIQR Survey

Tests for reliability				
Part of FIQR	**Cronbach α**	**No. of Items**		
Domain 1: Physical functioning	0.855	9		
Domain 2: Overall impact	0.663	2		
Domain 3: Symptoms	0.803	10		
Total FIQR	**0.895**	**21**		
Part of FIQR	**ICC (95% CI, *p* value)**	**MDC**	**SEM**	***p* value**
Domain 1: Physical functioning	0.769 (0.541-0.884)	0.438	1.096	< 0.001*
Domain 2: Overall impact	0.555 (0.129-0.772)	0.541	2.664	0.009*
Domain 3: Symptoms	0.720 (0.370-0.86)	4.735	1.417	< 0.001*
Total FIQR	**0.794 (0.579-0.899)**	**2.125**	**2.950**	**< 0.001***
Test for Criterion validity (with FiRST)				
	Pearson	***p* value**	**Spearman**	***p* value**
Domain 3 (Symptoms) with FiRST	0.364	0.018*	0.348	0.024*

Notes: *Significant at a value of p < 0.05.

Abbreviations: FIQR, Revised Fibromyalgia Impact Questionnaire; MDC, minimal detectable change; SEM: standard error of the mean; CI, confidence interval; ICC, interclass correlation coefficient; FiRST, Fibromyalgia Rapid Screening Tool.

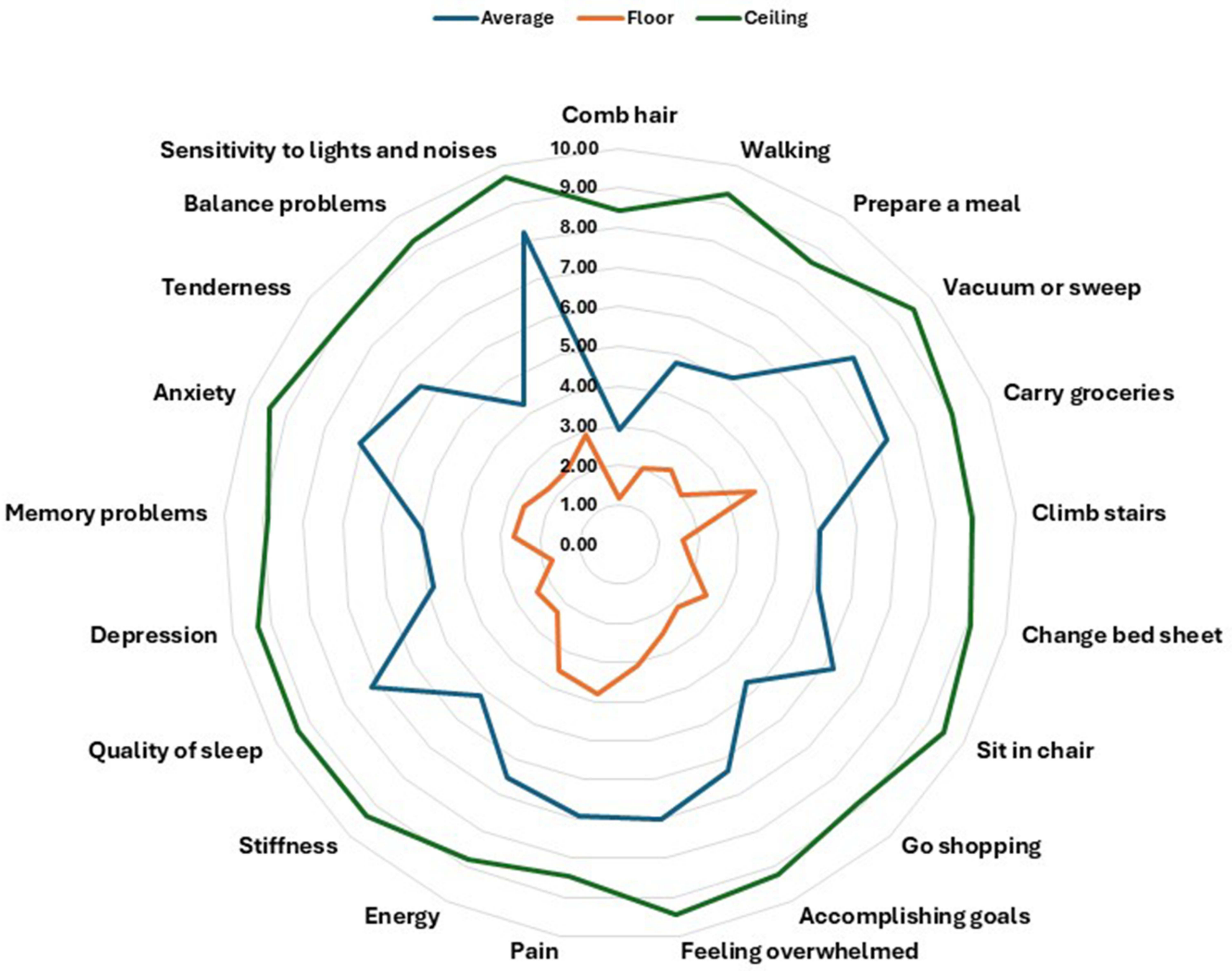

Figure 1 Radar chart of the FIQR items with floor and ceiling effect.

The radar chart visualizes the average values that reflect the sensitivity of participants to various aspects of FM and shows that participants had very high sensitivity to loud noises, sounds, and smells; difficulty with some house chores like vacuuming or carrying groceries; and less difficulty in brushing or combing hair, going shopping, and balancing. Participants also had a feeling of being overwhelmed and low quality of sleep but no depression or anxiety (Figure 1). The floor and ceiling effect was observed in the brush or comb the hair item and in the anxiety item, respectively (Supplementary Table 1 demonstrates the tabulated values of floor and ceiling effect).

Discussion

The current study aimed to translate, cross-culturally adapt, and examine the psychometric properties of the FIQR among Arabic-speaking FM patients. The findings confirmed the tool's validity and reliability in assessing the impact of FM among patients.

In general, the psychometric properties of Arabic instruments that assess the diagnosis and impact of FM are limited.[25,29–31] Srifi et al and Abu-Dahab et al conducted the Moroccan and Jordanian translations of the revised FIQR, respectively.[30,31] The Moroccan version of the FIQR was tested on 80 patients (63% were female). The test–retest reliability ranged from 0.72 to 0.87, and the Cronbach α ranged from 0.91–0.92, which demonstrated an acceptable level of internal consistency.[30] Another study in Jordan tested the psychometric properties of the FIQR among 92 female patients with FM. The internal consistency measured using the Cronbach α was 0.91, which is comparable to the

Moroccan version and our results as well. The test–retest reliability of the Jordanian version of the total FIQR was 0.93, which is slightly higher compared with our results and the Moroccan version of the FIQR. However, the Jordanian version excluded males from the study; therefore, the results should be interpreted with caution. The exclusion of males may hinder the reliability of the survey as gender diversity is always required in validation process. In addition, gender is related to differences in the cognitive function of individuals. The differences in the consistency and reliability (ICC) of the separate Arabic versions could relate to differences in culture.[32–34]

The small sample size of the current study, which corresponded to a limited number of FM patients, has limitations. In line with 2 studies conducted in Saudi Arabia,[25,35] Alodaibi et al found that more than half of physical therapists reported that less than 5 FM patients were treated annually,[35] whereas Alaujan et al reported a comparable number of patients (n = 46) when assessing the psychometric properties of the FiRST.[25] The sample size was further impacted by the challenges associated with patient recruitment. Their willingness to cooperate may be influenced by pain severity, emotional distress, and maladaptive behavior.[36,37] Patients were recruited through 2 settings to enlarge the sample size and enhance the sample population's diversity.

Regarding the implications, the FIQR is a PROM that has good psychometric properties, can discriminate FM patients from patients with other diseases, correlates with the original FIQ, takes less than 2 minutes to complete and 1 minute to score, and can be used online.[13] All these key factors reflect on the practicality of the FIQR for application in clinical practice and research. Moreover, although FM is more common in females, the FIQR was validated using both genders in this study, which will increase the applicability of its use in daily practice. The use of the Arabic-translated FIQR in this study will support local healthcare professionals in the effective assessment of their FM patients through a standardized quantitative data collection measure. Also, it allows patients to be involved in the clinical decisions process. Multiple studies reported an improvement of symptom control, patient satisfaction, supportive care measures, and health outcomes when using PROMs in routine clinical practice.[38,39] PROMs also play a crucial role in quality improvement, guideline development, policymaking, and reimbursement decisions by regulatory authorities and administrators.[40,41]

For future research, more studies using a larger sample of Saudi patients in various disease stages is strongly needed. Additional studies should also examine the psychometric properties in other Arabic-speaking countries.[30,31] According to Alaqeel et al, cross-cultural validation and structural validity of Arabic language instruments was generally poorly reported.[42] Further investigation is also needed into psychometric evaluations not performed in our study, such as responsiveness and the content and construct validity.

In conclusion, our study validates the Arabic FIQR as a robust, reliable, and culturally appropriate tool in the assessment of FM in Saudi Arabia.

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Author Contributions

SSA and HMA contributed equally to this work and are considered first co-authors. All authors made a significant contribution to the work reported, whether in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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