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# Translation and adaptation of the Arabic version of the injustice experience questionnaire in patients with chronic musculoskeletal pain

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**Abstract. – OBJECTIVE: The objectives of this study were to (1) translate the short version of the Injustice Experience Questionnaire (IEQ-SF) from English to Arabic and (2) test the validity and reliability of the translated Arabic version of the IEQ-SF.**

**SUBJECTS AND METHODS: A cross-sectional study in which the original English version of the IEQ-SF was translated into Arabic was conducted in accordance with Beaton's translation process. Internal consistency, reproducibility (retest within 5 days), and validity of the translated Arabic version of the IEQ-SF were tested in Arabic-speaking participants ($n$ = 20). Individuals with chronic pain ($n$ = 99) completed the Arabic versions of the IEQ-SF and the Musculoskeletal Health Questionnaire (MSK-HQ) from June to August 2021. The main analyses included Cronbach's alpha (α), Intraclass Correlation Coefficients (ICC), and Spearman's rank correlations (ρ).**

**RESULTS: The internal consistency (α = 0.74) and test-retest reliability (ICC = 0.88, 0.83-0.92 95% CI) for the translated Arabic version of IEQ-SF were high. There was also a high correlation between the translated Arabic version of the IEQ-SF and different health-related questionnaires such as the MSK-HQ (ρ = -0.738; $p < 0.001$), Hospital Anxiety and Depression Scale (ρ = 0.701-0.791; all, $p < 0.001$), and Pain Catastrophizing Scale (ρ = 0.762; $p < 0.001$).**

**CONCLUSIONS: The Arabic version of the IEQ-SF demonstrated high reliability and validity and would be useful for clinicians and researchers studying Arabic-speaking individuals with chronic pain.**

*Key Words:*
Injustice Experience, Pain, Outcome measure.

### Abbreviations

CI, confidence interval; HADS, Hospital Anxiety and Depression Scale; ICC, Intraclass Correlation Coefficient; IEQ-SF, Injustice Experience Questionnaire; MDC, Minimal Detectable Change; MSK-HQ, Musculoskeletal Health Questionnaire; PCS, Pain Catastrophizing Scale; SEM, Standard Error of Measurement.

## Introduction

Psychosocial factors are a major part of why chronic pain lasts for longer periods, and cognitive factors such as beliefs or worry can worsen a patient's prognosis and pain[1]. Pain is a complex and multifaceted issue that can take various physical or emotional forms and can have a lasting impact on the individual who has experienced it[1]. Injustice is a significant human rights issue that can result in inequality, discrimination, and bias. The combination of pain and injustice can be particularly difficult for those who experience it[1,2].

Perceived injustice is a new concept that includes different features, such as the severity and irreparability of a loss, who is to blame, and the feeling that something is unfair[2]. The experience of pain injustice is especially prevalent among marginalized communities[3]. Individuals in minority groups often experience systemic oppression, which can lead to increased stress, anxiety, depression, and chronic pain. The ongoing pain and trauma they face due to discrimination, bias, and inequality can result in severe physical and emotional distress as well as long-term harm[3].


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Moreover, those who experience pain and injustice find themselves in a fundamentally unfair situation in which they are denied the same rights and privileges as others. This can lead to feelings of anger, frustration, and disillusionment. Individuals may even develop a sense of hopelessness as they struggle to overcome barriers that prevent them from accessing opportunities that others enjoy[2,4-7]. Research shows that when those experiencing severe pain also feel unfairly treated, they experience difficulty returning to work and take longer to improve[2,4-7]. Even when other psychosocial factors that have a negative effect on chronic pain trajectories are taken into account, self-reported injustice affects important outcomes of chronic pain, such as pain severity, pain-related disability, emotional reactions, and distress[2,4,6,8,9].

The Injustice Experience Questionnaire (IEQ)[2] evaluates the level of injustice encountered by individuals with chronic pain and impairment after injury. The IEQ has been translated into different languages, such as Spanish, Japanese, Danish, German, and Swedish; each of these translations has yielded a genuine and dependable instrument[10-14]. Multiple clinical features, including pain intensity, disability, quality of life, pain catastrophizing, and psychological distress, are moderately or highly associated with the results of the IEQ[2,5,10-16]. In addition, research demonstrates that the IEQ has a high degree of internal reliability, with Cronbach's alphas ranging from 0.90 to 0.95[2,10-16], and excellent test-retest reliability with intraclass correlations ranging from 0.80 to 0.98[2,10,11,13,14]. The short version of the IEQ (IEQ-SF) has shown similar psychometric properties[17].

The prevalence of chronic pain in the Arabic population is high, with estimates falling in a wide range of 20-80% due to differences in the criteria used to define chronic pain, as well as variations in study populations and settings[18]. However, chronic pain is a significant and often untreated health problem in Arabic populations[18]. Therefore, the objectives of this study were to translate the IEQ-SF from English to Arabic and examine its validity and reliability in an Arabic-speaking population.

## Subjects and Methods

### Design and Ethics

This study employed a cross-sectional design and convenience sampling. This study underwent institutional review and received approval (ID: RHPT/021/017) from the Ethical Committee of College Applied Medical Sciences, Prince Sattam Bin Abdulaziz University, Alkharj, KSA. All of the participants indicated their informed consent in written form.

### IEQ-SF

The IEQ-SF instrument was translated into Arabic, and its internal consistency, reproducibility, and validity were tested in 20 Arabic-speaking participants. The Musculoskeletal Health Quality Questionnaire (MSK-HQ) was used to evaluate its construct validity.

### Translation Procedure for IEQ-SF

Approval for translation was obtained from the original author of the IEQ-SF. This study used Beaton's translation process, which entails forward translation, expert committee review, reverse translation, pretesting, and finalization. The translation from the original English text to Arabic was completed by two independent translators. Both translators demonstrated their ability to communicate fluently in Arabic and to comprehend English fully. Following agreement between their translations, the expert review committee verified the accuracy of the Arabic translations through back-translation by two translators who worked independently in which their original English translations were compared to the original questionnaires. Finally, the developer of the IEQ-SF was given the completed backward-translated version to check for potential translational errors. As part of the pre-testing process, a total of 20 participants were invited to respond to each question.

### Participants

A sample of 99 participants completed the Arabic translations of the IEQ-SF and MSK-HQ between June and August 2021. Individuals with chronic pain were included if they met the following criteria: (1) aged 18 years and above, (2) able to understand written Arabic, and (3) currently receiving treatment for chronic musculoskeletal pain lasting more than three months. Participants were excluded if they had rheumatic or neurological diseases.

### Procedure

Two physical therapists recruited and examined all participants who met the inclusion criteria. They completed an initial evaluation survey

that contained two sections: the first elicited demographic data such as sex, age, height, and weight; the second contained four questionnaires at the initial visit – the IEQ-SF, Hospital Anxiety and Depression Scale (HADS), Pain Catastrophizing Scale (PCS), and MSK-HQ. Additionally, data from the IEQ-SF were collected again within five days of the initial survey to measure test-retest reliability.

### Statistical Analysis

Cronbach's alpha was used to estimate internal consistency. If its value is between 0.70 and 0.90, the instrument's internal consistency is regarded as excellent[20,21]. Test-retest reliability was determined by calculating the Intraclass Correlation Coefficient (ICC) between the first and second administrations (two-way random-effects model, single measure) and the 95% confidence interval (CI)[20,21]. ICC values that exceeded 0.75 indicated excellent reproducibility, and values of 0.60-0.74, 0.40-0.59, and lower than 0.40 indicated acceptable, poor, and absent reproducibility. The Standard Error Measurement (SEM) was determined by increasing the standard deviation (SD) of the mean variations between the first and second administrations by (1-ICC). The Minimal Detectable Change (MDC) was computed by multiplying the SEM by 1.96 (MDC = SEM*1.96). Convergent validity was determined using Spearman's rank correlation coefficient to compare the IEQ-SF and MSK-HQ results[20,21]. Correlations of 0.90-1.00 are regarded as extremely high, while those of 0.70-0.90, 0.50-0.70, 0.30-0.50, and 0.00-0.30 are considered high, moderate, low, and insignificant, respectively. The statistical analysis was performed using SPSS software, version 27 (IBM Corp., Armonk, NY, USA). The level of significance was set at $p < 0.05$.

## Results

A total of 99 participants (66.7% male, 33.3% female) were included in this study, with an average age of 31.1 (SD = 9.8 years); 23% were smokers, and 74% had university degrees.

### Floor and Ceiling Effects

Floor and ceiling effects were assessed using data from all participants ($n$ = 99). No ceiling or floor effects were observed (no maximum or minimum score > 15%).

**Table I.** Reliability of the translated IEQ-SF.

| Items | IEQ-SF |
|---|---|
| First test | 3.0 (SD = 2.2) |
| Second test | 2.9 (SD = 2.2) |
| Mean difference | 0.1 |
| ICC (95% CI) | 0.88 (0.83-0.92) |
| SEM | 1.08 |
| MDC | 2.05 |

IEQ-SF, short version of Injustice Experience Questionnaire; ICC, Intraclass Correlation Coefficient; SEM, Standard Error of Measurement; MDC, Minimal Detectable Change.

### Internal Consistency

The internal consistency, based on the strength of the correlation among the five questions, was excellent, with a Cronbach's alpha of 0.74. If item 1 is removed, Cronbach's Alpha for the scale rises to 0.83.

### Test-Retest Reliability

Test-retest reliability was assessed for all 99 participants who completed the questionnaire twice, with an average of 5 and a standard deviation of 2 days between tests. The translated version of IEQ-SF showed excellent test-retest reliability; the ICC was 0.88, with a 95% confidence interval (CI) of 0.83-0.92. Table I shows the reliability of the results.

### Correlation Between Pain and Psychological Measures

The translated version of the IEQ-SF showed a high correlation with the MSK-HQ, HADS, and PCS scores. Table II shows the Spearman's correlations between the IEQ-SF and all measures.

**Table II.** Spearman's correlations between IEQ-SF and other instruments.

| Measures | Spearman's Rho |
|---|---|
| MSK-HQ - Total | -0.738** |
| HADS - Anxiety | 0.791** |
| HADS - Depression | 0.701** |
| PCS - Rumination | 0.694** |
| PCS - Magnification | 0.793** |
| PCS - Helplessness | 0.719** |
| PCS - Total | 0.762** |

IEQ-SF, short version of the Injustice Experience Questionnaire; MSK-HQ, Musculoskeletal Health Questionnaire; HADS, Hospital Anxiety and Depression Scale; PCS, Pain Catastrophizing Scale. **Indicates $p < 0.001$.

## Discussion

This study examined the psychometric characteristics of the Arabic version of the IEQ-SF. The results indicate that the Arabic version of the IEQ-SF has excellent internal consistency and test-retest reliability, confirming the validity and reliability of the translated questionnaire. This is consistent with the original study of the IEQ-SF conducted by Sullivan et al[17], who reported an alpha coefficient of 0.82, similar to the alpha coefficient of our Arabic version of the IEQ-SF ($\alpha = 0.74$), indicating excellent internal reliability. Other studies[2,8,10,23,24,31] have also reported high levels of internal reliability with values between 0.84 and 0.93. Furthermore, this finding is in line with existing data from previous studies[10-14,22,24] of versions in other languages, such as Hebrew, Danish, and Norwegian versions of the questionnaire. In line with previous studies[10-14,22,24], the construct validity of the Arabic version of IEQ-SF was also confirmed by significant correlations with the scores of the HADS, PCS, and MSK-HQ, indicating that greater perceived injustice is correlated with greater psychological distress, higher levels of pain catastrophizing, and lower levels of quality of life.

As pain is multi-dimensional, it is essential to understand the psychological aspects of pain experience[26,27]. Psychological factors such as cognitive appraisals (e.g., perceived injustice) have been shown[2,25,28,29] to be important determinants of pain experience and recovery. A recent systematic review[29] provided significant evidence that perceived injustice is associated with important outcomes such as pain intensity, disability-related outcomes, and quality of life. There is also evidence[2,5] that appraisals of injustice may trigger psychological and physiological changes that might increase pain intensity and complicate recovery for individuals with chronic pain. Furthermore, previous data[29] suggest that perceived injustice is linked to mental health outcomes, such as symptoms of depression and anxiety, which could explain the relationship between perceived injustice and HADS in this study.

To date, research examining the contribution of perceived injustice to pain experiences among Arabic-speaking populations has been limited. Previous research[30-32] has highlighted the broader sociocultural context underpinning injustice appraisals and the significant role of social treatment within the perceived injustice literature. Therefore, the availability of a reliable and valid questionnaire is critical for exploring how the perception of injustice might affect health and mental health outcomes in Arabic-speaking populations.

### Limitations

This study has several limitations. First, it used convenience sampling involving mainly male participants from Saudi Arabia, who might not be representative of all Arabic-speaking populations, thus possibly limiting the generalizability of the current findings. We recommend that future studies consider samples from different Arabic-speaking countries. Second, we did not distinguish chronic conditions among the respondents with chronic pain. This might have affected the results, as different conditions of chronic pain could have different effects on the experience of perceived injustice. Third, the sample size was relatively small. Future studies with larger sample sizes from different Arabic-speaking populations are thus recommended. Fourth, this study only assessed the convergent validity of the Arabic version of the IEQ-SF. While convergent validity is an important component of questionnaire validation, it is typically not sufficient on its own for thorough questionnaire validation. Future studies should, therefore, incorporate the other types of validity evidence (such as discriminant, criterion, content, and face validity) alongside the convergent validity to provide a comprehensive evaluation of the questionnaire's validity, especially since multiple sources of evidence will contribute to establishing the robustness and credibility of the Arabic version of the IEQ-SF.

## Conclusions

The findings of this study indicate that the translated Arabic version of the IEQ-SF is a reliable and valid instrument for measuring injury-related perceived injustice that is suitable for Arabic-speaking individuals with chronic pain. Furthermore, it might improve outcomes for individuals suffering from chronic pain by identifying critical psychosocial factors that could be relevant in explaining why chronic pain lasts longer. The Arabic version of the IEQ-SF can be incorporated into both clinical practice and research. However, special training for implementation in clinics may be required, especially for those who are not familiar with the IEQ-SF.

### Conflict of Interest
The authors of this work declare that they have no conflict of interest regarding the publication of this work.

### Informed Consent
Participants provided written informed consent after receiving detailed information about the purpose and methods of the study. This consent was obtained before their enrollment in the study.

### Ethics Approval
This study underwent institutional review and received approval (ID: RHPT/021/017) from the Ethical Committee of College Applied Medical Sciences, Prince Sattam bin Abdulaziz University, Alkharj, KSA.

### Authors' Contributions
The authors contributed equally to this work and take full responsibility for the conception, design, data collection, analysis, interpretation, and writing of the manuscript.

### Data Availability
The data supporting the findings of this study are available upon reasonable request made to the corresponding author.

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