

The Functional Assessment of Chronic Illness Therapy-Fatigue Measure: Cross-Cultural Validation of an Arabic Version for Older Jordanians

Abstract

Background: Numerous national and international nursing research studies have used the 13-item Chronic Illness Therapy Functional Assessment Chronic Illness Therapy (fatigue) (FACIT-F) scale to measure the level of self-reported fatigue among the elderly population. Nonetheless, a culturally adapted Arabic version of the scale of the same quality was required to boost its use in Arabic-speaking nations. This study cross-culturally validated the Arabic version of the FACIT-F scale and tested its validity and reliability in an Arabic-speaking population. **Materials and Methods:** We conducted the study among an elderly Jordanian population using a methodological cross-sectional approach. Using a cluster random selection technique, we randomly selected 250 older adults from a larger pool. We evaluated the scale's validity, internal consistency, and acceptability. We analyzed the construct validity using both confirmatory and exploratory factor analysis. **Results:** The Arabic version of FACIT-F was proven to be acceptable for the one-factor model in the elderly Jordanian population. Cronbach's alpha coefficient for the Arabic FACIT-F was 0.95, which indicated good reliability. Evidence suggested that construct validity for the FACIT-F was generally quite acceptable. **Conclusions:** With regard to evaluating fatigue in an older Jordanian population, the Arabic translations of the FACIT-F have been shown to be reliable and valid.

Keywords: Aged, fatigue, psychometrics, self-report, surveys and questionnaires

Introduction

Older adults frequently experience fatigue, which is closely tied to a lack of independence, a decline in physical activity, and a decline in functional capacities.^[1] Fatigue is frequently disregarded and underestimated despite its great incidence and clinical impact, and it is frequently thought to be an inevitable side effect of aging. The symptom's subjectivity and the lack of a gold standard for measurement make routine assessments in the clinical environment difficult. It is also important to note that the various literary operationalizations of fatigue (such as tiredness, exhaustion, lassitude, and anergia) also contribute to its inadequate understanding.^[1] Fatigue is a complicated symptom with a wide range of potential causes. Among the numerous theories put forth in the literature, those involving lack of sleep, anemia, mild depression, and malnutrition are probably the most promising ones.^[2] Nonetheless, despite the absence of significant physical or mental illnesses, many elderly people reported fatigue.^[3] As a

result, the absence of an "underlying disease" magnifies the impact of unexplained fatigue.^[4] Although numerous validated tools exist to assess fatigue, no universally endorsed tool serves as the gold standard for assessing fatigue in the elderly population.^[5] The fourth version of the Functional Assessment of Chronic Illness Therapy (FACIT) Fatigue Scale is a valid and trustworthy instrument that evaluates a person's level of fatigue during the previous week while they engage in their regular daily activities. This scale is a component of the Functional Assessment of Chronic Illness Therapy (FACIT) measure, which was created to assess the health-related quality of life of people with cancer and other chronic illnesses.^[6]

The FACIT Fatigue Scale is a self-reported tool devised to assess the level of fatigue experienced by elderly people during their everyday activities throughout the previous week.^[7] Arabic is one of the more than 45 languages, and this Fatigue Scale has been translated into. It may be applied in several clinical settings, including inpatient,

**Mohammad H. Abuadas¹,
Zainab Albikawi²,
Osama Khoury¹**

¹Department of Basic Nursing Science, College of Nursing, Al-Yarmouk University, Irbid, Jordan, ²Department of Clinical Nursing, College of Nursing, Al-Yarmouk University, Irbid, Jordan

Address for correspondence:
Dr. Mohammad H. Abuadas,
Founding Member of Jordan Honor Society Charter/STTI,
Al-Yarmouk University, Nursing College, Irbid, Jordan.
E-mail: mabuadas@yu.edu.jo

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outpatient, and community health.^[7] The Functional Assessment Chronic Illness Therapy (fatigue) (FACIT-F) scale has good psychometric qualities, such as high validity, reliability (internal reliability and test-retest reliability), and sensitivity for usage in individuals with various chronic medical diseases, such as Chronic Obstructive Pulmonary Disease (COPD),^[8] cachexia-anorexia syndrome,^[9] psoriatic arthritis,^[10] anemia,^[11] and in a wide-ranging population.^[12] Al Maqbali and Hughes^[6] conducted an earlier study that examined the psychometric features of the Arabic FACIT-F in cancer patients. However, neither its translation into Arabic nor its validation in an Arabic population have occurred to date. It would be extremely helpful for clinicians and academics to study the prevalence and consequences of fatigue related to aging and other medical disorders among Arabic-speaking patients and communities if an Arabic version of the FACIT-F could be developed and validated. Moreover, no previous studies have examined the psychometric features of the Arabic version of this scale in elderly people. Therefore, the aim of this study was to cross-culturally validate the Arabic version of the FACIT-F scale and test its validity and reliability in an Arabic-speaking population.

Materials and Methods

This study was conducted from November 2020 to August 2021. A cross-sectional methodological design was employed to perform this study among an older Jordanian population aged 60 years or more. The sampling frame involved the older Jordanian population who attended the comprehensive health centers in Amman (the capital), Jordan. A cluster random sampling technique was utilized for a selection of comprehensive health centers, where the Amman governorate was divided into four zones (east, west, south, and north). After that, two health centers were randomly selected from each zone. Then, a sample of the elderly Jordanian population aged 60 and older who were treated in these centers was invited to participate in this study. According to Boateng and Neilands^[13] recommendations, the sample size should be at least 200 participants, or a minimum participant-item ratio of >5:1. Therefore, 250 elderly people were found adequate to run the required analyses. A total of 280 questionnaires were distributed; however, only 250 elderly people completed the questionnaires. The eligibility criteria for participation included the following: a) older people aged 60 years or older; and b) having the willingness to participate in this study. On the contrary, the elderly who have a history of any psychiatric problems or are currently treated for cancer were excluded. Permission to validate the research tool was obtained from the original author using an e-mail request. The research tools comprised demographic data and FACIT Fatigue Measure-Version 4, which are discussed in greater detail below. Socio-demographic data that reflects participants' age, educational level, work, income/month in Jordanian dinar (JOD), and presence of

any chronic disease. FACIT Fatigue Measure-Version 4 is a short scale that consists of 13 items developed by Webster and Cella^[7] to evaluate the elderly's fatigue level during performing activities of daily living in the previous week. The responses are rated on a four-point Likert scale, where 4 indicates not at all fatigued and 0 indicates very much. However, the scores for two items (7 and 8) are reversed. This scale ranges from 0 to 52, whereas a score less than 30 indicates severe fatigue, and the higher scores reflect a better quality of life.

For study purposes, the already existing Arabic version of the questionnaire was adopted. The FACIT-F 13 items were translated into Arabic using the procedure outlined by Bonomi, Cella, and made.^[14] However, the FACIT team advises using a cross-cultural and linguistic review to test the instrument.^[15] The FACIT-F 13-item Arabic translation and the original English version were cross-culturally checked by two independent bilingual translators to make sure the instrument was appropriate for the research population. The Arabic version of FACIT-F provided by the FACIT organization did not require any word or sentence adjustments.

The managers of the health clinics were initially approached to help with research sample recruitment and add them to their files to filter out elderly people with psychiatric problems. The researchers then sent out the questionnaires to elderly people who met the eligibility requirements and expressed interest after being told about the study's goal and ethical guidelines. Face-to-face interviews were conducted with those who have difficulty reading and writing or cannot read or write at all.

All data analyses were performed using the IBM Statistical Package for Social Sciences (SPSS) software (version 21.0, IBM SPSS Corp., Armonk, NY) and Analysis of Moment Structure (AMOS) software (version 21.0, IBM Corp., Chicago) (Arbuckle, 2011). There were no missing values in the data. Descriptive statistics were used to describe the characteristics of the sample. The reliability of the scale was measured using internal consistency methods. The construct validity of the Arabic version of the FACIT-F scale (version 4) was tested using both Exploratory Factor Analyses (EFA) and Confirmatory Factor Analyses (CFA).

Ethical considerations

This study adhered to all ethical procedures. The Institutional Review Board (IRB) of Al-Yarmouk University, with reference number 22/845/18-19, as well as the Ministry of Health and the administrators of selected healthcare centers, approved this study. Informed consent was collected from the participants after explaining the purpose and benefits of this study. Also, the participants' right to engage or withdraw at any time without any potential harm was clarified. Confidentiality was maintained by requesting the participants to avoid writing their names or any identifiers on the questionnaire.

Results

Socio-demographic characteristics

The characteristics of the study participants are illustrated in Table 1.

Content validity

A panel of six experts used a one-round review process to evaluate the content validity index. The experts evaluated the relevance of the Arabic version of the FACIT-F scale (version 4) using a 4-point ordinal scale, scoring 1 = not relevant, 2 = somewhat relevant, 3 = fairly important, and 4 = highly relevant. The S-CVI was determined as the average percentage of items classified as 3 or 4 across all experts, whereas the item-content validity index was calculated as the number of experts giving a rating of either 3 or 4 divided by the total number of experts. According to Lynn's^[16] approach to assessing content validity, an acceptable I-CVI value is greater than 0.78 for each item, and an acceptable S-CVI value is greater than 0.8. Based on the following findings, the content validity of the FACIT-F scale (version 4) items and overall scale were established: I-CVIs ranged from 0.88 to 1.00, exceeding the 0.78 threshold, while the S-CVI was 0.94, exceeding the 0.80 threshold. These results show that the scale items are distinctively relevant to the constructs being measured.

Construct validity

To understand the factor structure of the Arabic version of the FACIT-F scale (version 4), the 13 items were pooled

and subjected to EFA. A principal component analysis was used to extract the factors. The obtained factors were rotated orthogonally using the varimax procedure. Sampling adequacy was assessed by Kaiser–Meyer–Olkin and Bartlett tests before evaluating the results of the EFA. The Kaiser–Meyer–Olkin was 0.92, and the Bartlett test results were quite significant ($\chi^2 = 4337.71$, $df = 78$, $p < 0.001$). All factors with an eigenvalue ≥ 1 were retained. A minimal clean factor-item loading of ≥ 0.40 was set for the inclusion of an item in a factor; factor loading is considered clean if the absolute difference between the loadings is >0.20 (I. Nunnally and Bernstein, 1994). The initial analysis extracted two significant factors. The majority of items (twelve out of thirteen) were loaded on the first factor, and the total explained variance by all factors together was 79.44%. All the items except for item 9 (An 8) loaded together as Factor 1 and accounted for 69.28% of the variance. Factor 2 accounted for about 10.16% of the variance and represented only one item (item 9). Considering the fact that the factor must have at least 2 items to be considered a reliable factor and the insufficient item loading of - 0.13, item 9 was deleted, and analysis was performed again without this item. The second analysis extracted only one significant factor. The twelve items loaded together as Factor 1 and accounted for 74.93% of the variance. The loadings ranged from 0.74 to 0.93 in the rotated pattern matrix in the present study. Table 2 presents a summary of the 13 items and factor loadings that result from EFA. The findings from the EFA resulted in the same structure as originally established by the author, except for item 9. Confirmatory factor analysis is used to determine the goodness of fit between a hypothesized model and the data obtained from study samples.^[17] In this study, CFA using the maximum likelihood estimation method was used to evaluate the construct validity of the one-factor model extracted from EFA. It is recommended to use different fit indices to determine the goodness of fit of the model.^[17] A non-significant chi-square result is an indication of fit because the researcher seeks to confirm the null hypothesis.^[17] However, the chi-square goodness of fit is inadvisable because it is greatly influenced by sample size and violations of multivariate normality.^[18] So, chi-square statistics shouldn't be the only way to figure out how well a data set fits a model. The following criteria were used to assess the fit of the measurement model: (a) factor loadings should have a Critical Ratio (CR) >1.96 , (b) the index of relative chi-square (χ^2/df) should be <2 , (c) the Comparative Fit Index (CFI) and the Normed Fit Index (NFI) should be >0.90 , (d) the Goodness-of-Fit Index (GFI) and Adjusted Goodness-of-Fit index (AGFI) should be >0.90 , and (e) the standardized Root Mean Square Residual (RMR) and Root Mean Square Error of Approximation (RMSEA) should be <0.5 .^[17] In this study, all factor loadings were found to be between 0.69 and 0.95 [Figure 1]. All factor loadings were found to have a Critical Ratio (CR) that was greater than 1.96, indicating statistical

Table 1: Characteristics of the study sample (n=250)

Characteristics	n (%)
Elderly's age,	Mean (SD)
Range [60-89]	71.25 (7.46)
Gender	
Male	120 (48)
Female	130 (52)
Elderly's Educational level	
Illiterate	70 (28)
Secondary and less	106 (42.40)
Higher than secondary	74 (29.60)
Elderly's work	
Yes	77 (30.80)
No	173 (69.20)
Income/month	
less than 500 JOD	65 (26)
500 \geq 1000 JOD	155 (62)
1000 JOD and more	30 (12)
Presence of chronic disease except cancer	
Yes	165 (66)
No	85 (34)

number, %: percentage, SD: standard deviation, M: Mean

Table 2: Exploratory factor analysis of Functional Assessment Chronic Illness Therapy (fatigue)(FACIT-F) scale (version 4) (n=250)

Factor (Label)	Factor 1	
Item/Loading	Item	Loading
	1(HI7-I feel fatigued)	0.89
	2(HI2- I feel weak all over)	0.91
	3(An1- I feel listless (“washed out”))	0.92
	4(An2- I feel tired)	0.93
	5(An3- I have trouble starting things because I am tired)	0.92
	6(An4- I have trouble finishing things because I am tired)	0.89
	7(An5- I have energy)	0.74
	8(An7- I am able to do my usual activities)	0.73
	10(An12- I need to sleep during the day)	0.84
	11(An14- I am too tired to eat)	0.87
	12 (An15- I am frustrated by being too tired to do the things I want to do)	0.88
	13(An16- I have to limit my social activity because I am tired)	0.83
Eigenvalue	8.99	
Variance explained	74.92%	

significance. The amount of variance (R^2) attributable to each item ranged from 58% to 91%. The fit indices for the 12-item model were $\chi^2 = 1045.57$, $df = 54$, $p < 0.001$, $GFI = 0.56$, $AGFI = 0.37$, $CFI = 0.77$, and $RMSEA = 0.27$ [Table 3]. The majority of the results showed that the model was poorly fitted.

Reliability

The reliability of the scale was measured using internal consistency methods. Scale internal consistency was measured by Cronbach’s alpha for the total scale. The best method used to evaluate internal consistency is Cronbach’s alpha (Polit and Beck, 2013). Cronbach’s alpha of about 0.7 is sufficient, and >0.80 indicates a high internal consistency of the scale (Polit and Beck, 2013). Furthermore, the following criteria were used to identify poorly functioning items: (a) an increase of more than 0.10 in the total scale reliability when the item was deleted, or (b) a correlation of <0.30 between an item and the subscale score (J. C. Nunnally et al., 1967).^[19] In this study, Cronbach’s alpha was applied to the scale and was 0.95, which is an acceptable value. All the corrected item-total correlations were found to be >0.30 and ranged from 0.80 to 0.90. The item analysis revealed that no item was predicted to significantly increase the scale reliability if omitted; therefore, no omission was made. Finally, Cronbach’s alpha coefficient for the scale was 0.95. These values indicate

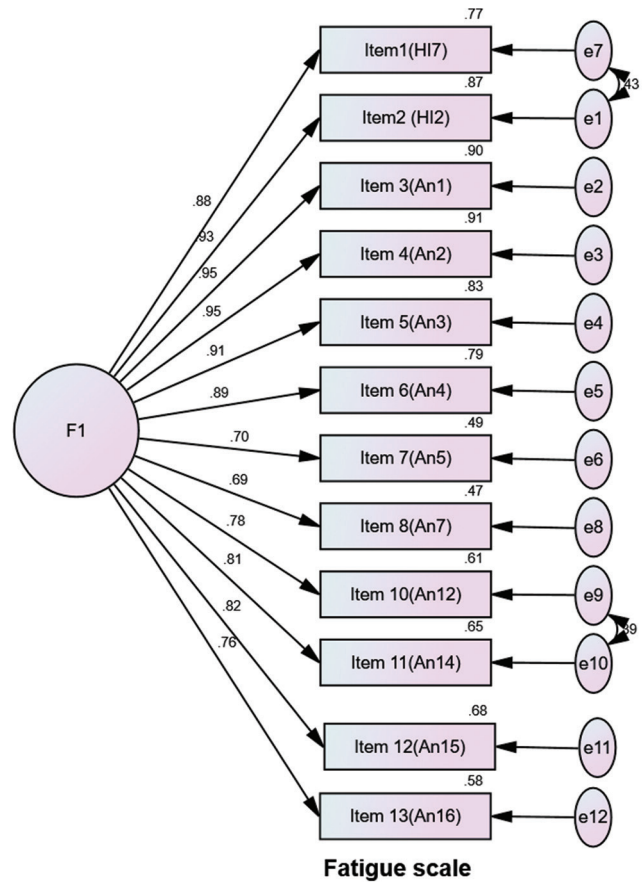


Figure 1: Path diagram displaying the confirmatory factor analysis and standardized regression for the Functional Assessment of Chronic Illness Therapy-Fatigue Scale (N = 250)

that the scale items have distinguishing consistency with one another.

Discussion

The main purpose of this study was to test the psychometric properties of the Arabic version of the FACIT-F Measure (version 4) among an older population aged 60 years and over. The present study has shown that the Arabic version of the FACIT-F measure (version 4) reached an acceptable level of reliability and validity. The internal consistency reliability of the Arabic version of the FACIT-F was 0.95, which was higher than the reported reliability in all other studies.^[6,11,20-22] Moreover, the Arabic version of the FACIT-F Measure (version 4) showed moderate evidence of construct validity. Exploratory and confirmatory factor analyses were conducted for the FACIT-F scale. The results obtained from EFA identified one factor, and all the items except for item 9 load on their respective factors with high and clean loadings. All these items met the loading criterion and loaded significantly on their respective factors. Item number 9 (I need to sleep during the day) presented a problem regarding its low factor loading of 0.35. This may be attributed to the incorrect Arabic translation. In the English-Arabic comparison, for Item 9 (I need to sleep

Table 3: Goodness-of-fit indices for Functional Assessment Chronic Illness Therapy (fatigue)(FACIT-F) scale (version 4)

Fit Indices	The Functional Assessment of Chronic Illness Therapy-Fatigue Scale Results
CMIN/DF or (χ^2/df^*)	(1045.57/54)=19.36
RMR**	0.15
RMSEA***	0.27
GFI****	0.56
AGFI [§]	0.37
CFI ^{§§}	0.77
NFI ^{§§§}	0.76

χ^2/df , relative Chi-square; **RMR, standardized root mean square residual; ***RMSEA, root mean square error of approximation; ****GFI, goodness-of-fit index; [§]AGFI, adjusted GFI; ^{§§}CFI, comparative fit index; ^{§§§}NFI, Normed fit index

during the day), “day” is translated into Arabic as “Sabah,” which means morning. This may have been misinterpreted by the participants.

The CFA of FACIT-F has been proposed as a unidimensional scale, with the range of factor loadings being acceptable (0.70 to 0.95). The possible explanation for the high correlation between items was that the participants had given similar answers to items 2, 3, 4, and 5. This may indicate that these items have similar content. Another probable rationale for the correlation between these items is due to the translation. In the English-Arabic comparison, for Item 2 (I feel weak all over), item 3 (I feel listless (“washed out”)), Item 4 (I feel tired), and Item 5 (I have trouble starting things because I am tired), the Arabic words for “tired,” “weak,” and “listless” are “taab,” “Taaf,” and “Khomol,” respectively. These three words have similar meanings in modern Arabic and may have been misinterpreted by the participants. Interestingly, the CFA results diverge from other studies that showed an acceptable fit of the unidimensional one-factor structure model.^[6,14,23-25] The author suggests maintaining the same instrument structure as the original publication to avoid violating the psychometric requirements for the translated instrument. In addition, future research can expand on this study’s findings by applying the FACIT Fatigue Scale to larger and more diverse groups of older individuals. The content validity of the Arabic version of the FACIT-F scale could be enhanced by qualitative research in which participants add specific information to each item. The high item-to-item correlation in the final model could be explained by the fact that Items 1 and 2 have a lot in common conceptually. Item 9 and Item 10 were also shown to have a high degree of association, which may be explained by the fact that both deal with the negative outcomes of fatigue. Cronbach’s alpha was applied to the scale and was 0.95, which was higher than the original study of Butt *et al.*^[26] The internal consistency of the FACIT-Fatigue in Spanish was 0.88,^[27] and in Poland, it was 0.79.^[28] There were a number of limitations in the

current study. First, the questionnaire’s stability over time was not evaluated. Second, cross-validation studies are required to confirm the item distribution and factor structure, as well as the reliability and validity of the instrument in various populations. The primary contribution of this work is that evaluating the psychometric features of the FACIT Fatigue Scale would (a) aid in clinically identifying senior individuals suffering from fatigue and (b) motivate additional research on elderly individuals in a variety of contexts.

The research possesses certain limitations. The sample was obtained from a limited number of clinics using convenience sampling, thus compromising its representativeness of the target population; yet, data collection was conducted across four major geographical zones, which may enhance the sample’s representativeness. Secondly, the study employed a cross-sectional design, which precludes conclusive causal linkages among the study variables.

Conclusion

This study is one of the few that assessed the psychometric properties of the Arabic Version FACIT-F scale (version 4) among the elderly population in Jordan. The 13-item Arabic versions of the FACIT-F have acceptable psychometric properties of internal consistency and construct validity. Therefore, the Arabic version of FACIT-F is a reliable and valid tool to assess fatigue among the elderly population in Jordan. Further research on the Arabic versions should be conducted to assess test-retest reliability.

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Conflicts of interest

Nothing to declare.

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