



Validation of Multidimensional Persian Version of the Work-Family Conflict Questionnaire among Nurses

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Abstract

Background: Several instruments have so far been developed in English language to measure the level of work-family conflict and further validation is required for non-English speakers.

Objective: To test factorial structure and construct validity of the Persian version of work-family conflict scale among Iranian nurse.

Methods: This study was conducted among 456 Iranian nurses working at public hospitals in 17 provinces from March 2015 to September 2015. We used a self-administrated questionnaire to collect information. Exploratory factor analysis was run using SPSS 21. Then, construct validity was evaluated using confirmatory factor analysis (CFA), convergent validity, and discriminant validity by AMOS 21.

Results: Exploratory factor analysis extracted four dimensions that explained 65.5% of the variance observed. The results of confirmatory factor analysis showed that our data fitted the hypothesized four dimensional model of work-family conflict construct. The average variance extracted was used to establish convergent and discriminant validity.

Conclusion: The Persian version of work-family conflict questionnaire is a valid and reliable instrument among Iranian nurses.

Keywords: Factor analysis, statistical; Reproducibility of results; Work; Family; Surveys and questionnaires

Introduction

Work-family conflict refers to the degree of how work and family responsibilities are incompatible.¹ Lack of ability to balance work obligations and family responsibilities may lead to conflict between work and family do-

mains. This type of inter-role conflict initially was introduced as a uni-dimensional construct.¹ Shortly after introducing work-family conflict, several researchers began to consider it as a two-dimensional construct namely “work interference into family” (WIF) and “family interference into work” (FIW).^{2,3} WIF direction is predicted mainly by work stressor such as work-

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ing hour and work condition, while family stressors are better predictors for FIW. On the other hand, WIF is strongly associated with FIW, indicating that the two proposed directions (WIF and FIW) are parts of a bigger construct namely “work-family conflict” (WFC). In General, WIF has work-based antecedents, but leads to family-related outcomes. Conversely, FIW has family-based predictors that in turn influences work-related outcomes. Therefore, the overall WFC construct has both work-related and family-related antecedents, which could lead to both work- and family-related consequences.

In addition to the understanding of the bi-directional nature of work-family construct, Greenhaus and Beutell¹ proposed the different sources of the conflict. Three dimensions were recognized under each direction. These dimensions are time-based, strain-based, and behavior-based WFCs, which yield to six dimensional construct for WFC. The time-based conflict refers to the difficulties of performing one role's responsibilities due to lack of enough time that has been devoted to participate in another role. The strain-based conflict considers the stress and tension that originate from one role interfere with fulfilling demands of another role. Finally, the behavior-based conflict arises when the required behavior in one role is inappropriate, incompatible, and ineffective with another domain. However, there are little empirical evidence for the behavior-based conflict due to difficulties in its operationalization and measurement.

Several instruments have so far been developed in English language to measure the level of WFC. Some of these questionnaires are intended to measure only uni-dimensional WFC, while some can measure multiple dimensions of WFC. Kelloway, *et al*,⁴ introduced the four-dimensional construct, which measures the source, nature and direction of WFC. The 22-item ques-

tionnaire developed by Kelloway⁴ is able to distinguish WIF and FIW along with two dimensions. However, this questionnaire is in English and further validation is required for non-English speakers. Previously, this questionnaire has been validated in Malay language.⁵ The questionnaire developed by Kelloway⁴ was validated mostly among nurses. Health care workers, especially nurses who work in rotation shifts, are among those who may experience WFC more frequently.⁶ Majority of studies have shown that long work hours, shift work, and high workload are strongly associated with WFC.^{7,8} Nurses are working under difficult situations in many countries. Iran is one of the developing countries with shortage of nurses.⁹ Therefore, it is necessary to have a validated instrument in Persian language that allows Iranian researchers to bring WFC in line with other fields of nursing research. We were aware of a validated WFC questionnaire in Persian language.¹⁰ However, this questionnaire was generalized to a wide range of occupations and was not specifically targeted at nursing profession. This study was therefore conducted to examine

TAKE-HOME MESSAGE

- Lack of ability to balance work obligations and family responsibilities may lead to conflict between work and family domains.
- Work interference into family (WIF) direction is predicted mainly by work stressors such as working hour and work condition, while family stressors are better predictors for family interference into work (FIW).
- Several instruments have so far been developed in English language to measure the level of WFC and FIW.
- This study supports the cross-cultural validity of the Persian version of the WFC questionnaire developed by Kelloway. The Persian version of the questionnaire is a valid measure to be used in Iranian nurses.

the validity, reliability and factor structure of the Persian version of WFC questionnaire that was developed by Kelloway to be used in Iranian nurses.

Materials and Methods

This study was conducted on 456 Iranian nurses who were working in public hospitals. Data were collected from 17 different provinces. We used a self-administrated questionnaire to collect information about socio-demographic as well as WFC.

Sample/Participants

The study sample consisted of 456 nurses from 17 provinces of Iran. The majority (72.4%) of nurses were female. The mean age of participants was 33.5 (SD 7.4) years; 93% of participants had bachelor in nursing, only 2% had post-graduate degree. Studied nurses were mainly (77%) married, had a mean of 1.1 children and their mean working hour was 166.0 (SD 30) hours per month. Majority of respondents (82.5%) were working in rotation shifts, which included evening and night shifts.

Instruments

The 22-item questionnaire developed by Kelloway⁴ was used to measure the nature and source of WFC. The questionnaire measures four dimensions including time-based work interference into family (WIFt), strain-based work interference into family (WIFs), time-based family interference into work (FIWt), and strain-based family interference into work (FIWs). Answers to these 22 items are Likert type and can vary from '1' (strongly disagree) to '5' (strongly agree). Strain-based WIF and FIW contain six questions per dimension and the answer can vary from 6 to 30. Time-based WIF and FIW contain five questions per dimension and the answer can vary from 5 to 25. A higher score in each dimension indicates a higher level of WFC.

Translation and Pre-test

The WFC questionnaire was translated into Persian using backward-forward method by two different groups of bilingual experts. Pre-test was conducted among 10 respondents; a pilot study was conducted among 50 nurses. The 10 respondents for the pre-test and 50 nurses for the pilot study were chosen from various cities. These nurses were different from those who participated in the main research. The purpose of the pre-test was to establish the face validity of the questionnaire. This was to ensure the wording of the questionnaire was correct and easy to understand for all respondents. Next, content validity was established using a panel of experts. Then, the primary version of the Persian questionnaire was piloted among 50 nurses. The questionnaire was finalized after making the necessary modifications based on information obtained from the pilot study.

Ethics

This study was approved by the Ethics Committee of Ilam University of Medical Science. Prior to data collection, subjects were informed about study benefits and their rights to participate voluntarily. Respondents were informed that they were able to withdraw from the study at any point without any consequences. Participants signed an informed written consent before data collection.

Statistical Analysis

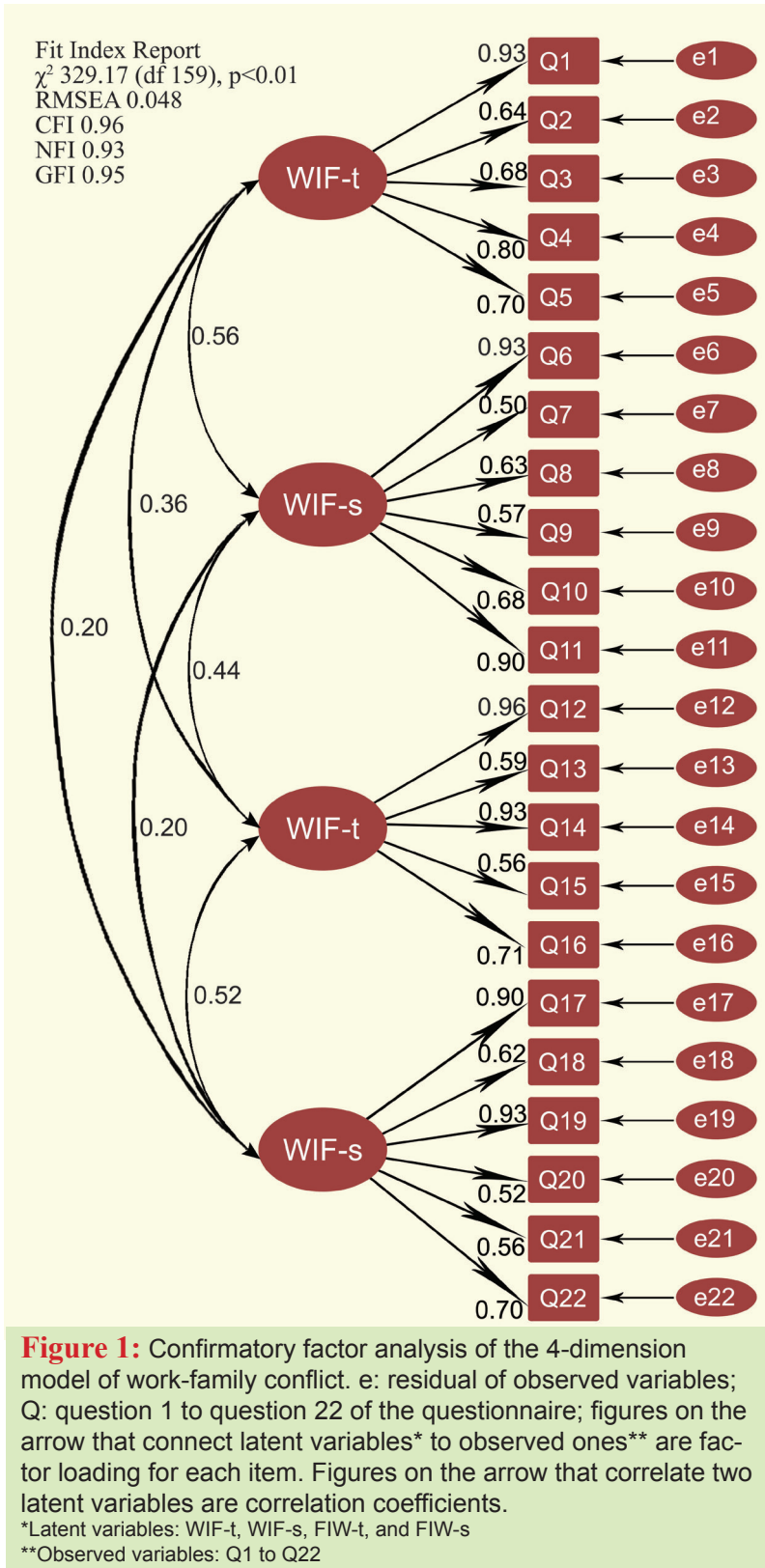
We used SPSS® for Windows® ver 21 for data analysis. Exploratory Factor Analysis (EFA) using varimax rotation was conducted to identify the factor structure of the Persian version of the questionnaire. Exploratory Factor Analysis (EFA) was conducted using Principal Component Analysis (PCA) by varimax rotation for the 22-item WFC questionnaire. We allowed SPSS to extract dimensions with eigenval-

For Persian version of the questionnaire see the online version of the article.

Table 1: Factor structure of the Persian version of the work-family conflict questionnaire

No	Items	Component		
		FIW-s	WIF-t	FIW-t
Variance explained by WIF-t=22%				
1	I have to change plans with family members because of the demands of my job.		0.80	
2	Job demands keep me from spending the amount of time I would like with my family.		0.84	
3	Job responsibilities make it difficult for me to get family chores/errand done.		0.67	
4	To meet the demand of my job, I have to limit the number of things I do with family members.		0.73	
5	My job prevents me from attending appointments and special events for family members.		0.61	
Variance explained by WIF-s=12.7%				
6	After work I have little energy left for the things I need to do at home.	0.65		
7	I think about work when I am at home.	0.79		
8	I do not listen to what people at home are saying because I am thinking about work.	0.79		
9	After work, I just need to be left alone for a while.	0.61		
10	My job puts me in a bad mood at home.	0.50		
11	The demands of my job make it hard for me to enjoy the time I spend with my family.	0.55		
Variance explained by FIW-t=20.3%				
12	I would put in a longer workday if I had fewer family demands.			0.74
13	My family demands interrupt my workday.			0.67
14	Family demands make it difficult for me to take additional job responsibilities.			0.73
15	I spend time at work making arrangement for family members.			0.63
16	Family demands make it difficult for me to have the work schedule I want.			0.54
Variance Explained by FIW-s=10.5%				
17	When I am at work, I am distracted by family demands.	0.81		
18	Things going on in my family life make it hard for me to concentrate at work.	0.73		
19	Events at home make me tense and irritable on the job.	0.83		
20	Because of the demands I face at home, I am tired at work.	0.65		
21	I spend time at work thinking about the things that I have to get done at home.	0.69		
22	My family life put me into a bad mood at work.	0.70		

FIW-s: Strain-based Family Interference into Work, FIW-t: Time-based Family Interference into Work, WIF-s: Strain-based Work Interference into Family, WIF-t: Time-based Work Interference into Family



ue >1 and suppress factor loadings <0.40. The construct validity was evaluated using Confirmatory Factor Analysis (CFA), convergent validity and discriminant validity by AMOS 21 software. AMOS is a popular software program for assessing the proposed relationships and measurement models in a structural equation model. AMOS allows users to build models more accurately than with standard multivariate statistical techniques. We used Bayesian Estimation to allow AMOS to read the numerical values underlying the ordered categorical data. Bayesian Estimation is expected to give more accurate imputations through items than it would be derived from a less restrictive model. The usefulness of the CFA model was assessed by the following indices: Root Mean Square Error of Approximation (RMSEA) with an acceptance level of <0.08,¹¹ Goodness of Fit Index (GFI) with acceptance level of >0.90,¹² Comparative Fit Index (CFI) with acceptance level of >0.90,¹³ and Normal Fit Index (NFI) with an acceptance level of >0.90.¹⁴ The factor-based internal consistencies of the four dimensions were assessed by Cronbach's α .

Results

Exploratory Factor Analysis (EFA)

The results of EFA are presented in Table 1, where the extraction of four dimensions with eigenvalues >1 are shown. EFA is a statistical method in factor analysis to identify structure of a relatively large set of variables. With factor loadings ranging from 0.61 to 0.84, items 1 to 5 fall within the second dimension. These items are intended to measure WIF-t. Items 6 to 11 fall within the third dimension with factor loadings ranging from 0.54 to 0.79; these items are intended to measure WIF-s. Having factor loadings from 0.55 to 0.74, items 12 to 16 fall within the third dimen-

sion and are expected to measure FIW-t. Finally, Items 17 to 22 fall within the first dimension with factor loadings ranging from 0.63 to 0.89; these items are projected to measure FIW-s.

Confirmatory Factor Analysis

The four-dimensional construct extracted from EFA was examined by CFA in AMOS. CFA is used to confirm the four dimensions of the questionnaire obtained earlier in EFA (Fig 1). Bayesian Estimation was used to allow AMOS to read the numerical values underlying the ordered categorical data.¹⁵ All the indices obtained from CFA showed goodness of fit and implied that the four dimensional construct model fitted into our data (Fig 1).

Discriminant Validity

Discriminant validity was assessed to ensure each latent variable in the model (WIF-t, WIF-s, FIW-t, and FIW-s) can be discriminated from other three constructs. We calculated the Average Variance Extracted (AVE) for each latent variable using the equation:

$$AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n}$$

where λ represents standardized factor loading, and n is the number of items (Table 2).

When AVE for each latent variable is greater than the shared variance of the other variables, discriminant validity is established; there was adequate evidence to support the four dimensionality of the Persian version of the questionnaire (Table 2).

Convergent Validity

According to the Fornel and Larcker¹⁶ recommendation, convergent validity can be established if AVE for all dimensions exceeds 0.50; in our analysis, AVE for the four dimensions was >0.50.

Table 2: Shared variance (square of correlation) and the discriminant validity

Variable	AVE*	WIF-t	WIF-s	FIW-t
WIF-t	0.57	1		
WIF-s	0.52	0.31 [†]	1	
FIW-t	0.59	0.15 [†]	0.19 [†]	1
FIW-s	0.52	0.04 [†]	0.04 [†]	0.27 [†]

*AVE: Average Variance Extracted; [†]p<0.01

Factor-based Reliability Analysis

The internal consistency of the four dimensions was evaluated by Cronbach's α . The values were 0.83 for WIF-t, 0.78 for WIF-s, 0.76 for FIW-t, and 0.83 for FIWs.

Discussion

The main purpose of this research was to assess the factorial structure of Kelloway⁴ WFC questionnaire among Persian speaking nurses in Iran. Our analysis indicated that factor structure of the Persian version is consistent with the original English version where the four dimensions are distinguishable. These four dimensions are time-based WIF (items 1 to 5), strain-based WIF (items 6 to 11), time-based FIW (items 12 to 16), and strain-based FIW (items 17 to 22). Our results indicated that the Persian version of the examined scale is able to distinguish both the nature and directions of WFC.

To the best of our knowledge, this is the first study that evaluates validity and factor structure of the WFC questionnaire specifically among nurses. We are aware of one previously validated questionnaire in Persian language that measures the six dimension of WFC.¹⁰ However, Karimi examined the WFC questionnaire developed by Carlson, *et al*,¹⁷ among variety of occupations, not specifically among nurses.

Another purpose of this study was to evaluate convergent and discriminant va-

lidity of the Persian version of Kelloway⁴ WFC questionnaire. Our analysis confirmed the discriminant validity of the questionnaire, which implied that the four dimensions are unrelated and measure separate concepts. In addition, the convergent validity was also established in this study, which indicated that all four items are related to the same construct.

There are some limitations in our study. First, our sample mainly consisted of female nurses. Generalizing the findings to both men should be done with cautious. Nevertheless, nursing is a female dominated profession.¹⁸ In addition, some studies showed no gender difference in the WFC and even encourage scholars to focus on men's experience of WFC.^{19,20} The second limitation of the present study was the use of Bayesian estimation method to impute the numerical values underlying the ordered categorical responses. The Bayesian estimation was conducted based on the model extracted from EFA. Therefore, future researchers are recommended to run a factor analysis prior to actual data analysis.

In conclusion, this study supports the cross-cultural validity of the Persian version of the WFC questionnaire for Iranian nurses.

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Conflicts of Interest: None declared.

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