

# Psychometric Properties of a Screening Instrument for Domestic Violence in a Sample of Iranian Women

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## Abstract

**Background:** Domestic violence against women is regarded as an important health problem among women and a serious concern in issues related to human rights. To date, a few screening tools for domestic violence exist for Iranian married women, but they assess only some of the domestic violence components.

**Objectives:** The present study aimed to design and determine the validity and reliability of a screening instrument for domestic violence in a sample of Iranian women.

**Materials and Methods:** The present study was a cross-sectional psychometric evaluation conducted on 350 married women in Ilam, Iran, in 2014. The samples were selected through multistage sampling and the main method was cluster sampling. A 20-item, self-administered questionnaire was validated by exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). An Eigen value > 1 and a loading factor > 0.3 for each component were considered as indices for extracting domestic violence components. Reliability was calculated by test-retest and Cronbach's alpha. Also, the content validity index (CVI) and content validity ratio (CVR) were used to measure content validity. The data were analyzed using SPSS-13 and LISREL 8.8 software programs.

**Results:** The self-administered instrument was completed by 334 women. The CFA and EFA methods confirmed embedding items and the three-factor structure of the instrument including psychological, physical, and sexual violence, which explained 66% of the total variance of the domestic violence. The ICC and Cronbach's alpha coefficients were > 0.7 for the components of the questionnaire. The test-retest also revealed strong correlations for each of the domestic violence components ( $r > 0.6$ ).

**Conclusions:** The used instrument for measuring domestic violence had desirable validity and reliability and can be used as a suitable instrument in health and social researches in the local population.

**Keywords:** Women, Domestic Violence, Psychometric

## 1. Background

Domestic violence against women (gender-based violence) is regarded as an important health problem among women and a serious concern in issues related to human rights. Domestic violence often is perpetrated by the husband, and housewives frequently suffer from the abuse (1-4). Despite supportive legislation against domestic violence worldwide, it is prevalent in most countries, affects the lives of millions of women throughout the world, and is present in all cultural, socio-economic, and educational levels. In addition, it occurs in all communities, regardless of religion, race, ethnicity, or other factors (1, 5). In general, no country is exempt from the damaging physical and emotional effects of domestic violence (2). In a study in north Iran, 73.5% of women reported a degree of physical violence (6).

Domestic violence is believed to be hidden because most women who suffer from domestic violence do not officially declare any incidence of violence to health or legal organizations due to cultural beliefs, economic barriers, fear of losing their children, distrust of health authorities, and low awareness (6-8). In previous researches, the most prevalent forms of domestic violence were (A) physical violence including any injury, pushing, maltreating, kicking, and shooting; (B) psychological violence including bullying, creation of fear, blackmailing, and controlling behaviors such as isolation of the woman from her family, friends, or social life and forcing her to stay at, or leave, the home; (C) sexual violence that covered all methods of sexual assault; (D) economic deprivation that involves controlling the woman's income or job and

precluding her from economic freedom; and (E) verbal or mental violence that includes mocking, insulting, making fun of personal weaknesses, humiliating nicknames, screaming, and shouting (9, 10). Recent studies revealed that individually answered questionnaires were better at identifying components of domestic violence than observation or interview. Regarding the results of the current studies, the questionnaire method proved better for screening domestic violence in women (11, 12).

Providing a single instrument to measure the components of domestic violence has always been a main challenge for researchers. Since domestic violence contains diverse components among societies, measuring instruments vary in different researches (13). One of the main standard instruments for assessment of domestic violence is the hurt-insult-threaten-scream (HITS) instrument, which includes physical hurt, insult, threat and scream components, and was tested in an American female population (12). In addition, among the available instruments for measuring domestic violence in women, the most valid instrument is the violence against women (VAWI) instrument constructed by the world health organization (WHO) for multi-country research on domestic violence against women. The components of the VAWI instrument were psychological, physical, and sexual violence. VAWI was made in cooperation with several networks and expert groups and was based mainly on the original conflict tactics scales (14).

To date, a few screening tools for assessing domestic violence have been developed for Iranian married women, but they only include some of the domestic violence components, such as Jazayeri's (2010) physical abuse, physical injury, affection abuse, sexual abuse, and negotiation subscales (15). Also, in electronic searches by researchers of the present study in SID, Iranmedex, Magiran, PubMed, Embase, Cochrane Library, Proquest, Scopus, and Springer databases did not find any papers about validation of domestic violence in married Iranian women from 2000 to 2015. Therefore, it is important to develop and evaluate psychometric properties of a Persian-language domestic violence instrument for married Iranian women.

## 2. Objectives

The present study aimed to design an instrument to assess domestic violence in married women based on the VAWI and HITS tools and to determine the psychometric indicators of this instrument in a sample of married Iranian women.

## 3. Materials and Methods

### 3.1. Study Design and Participants

The present study was a cross-sectional psychometric evaluation that was conducted of 350 married women

in Ilam, Iran, in 2014. The minimum sample size usually is considered to be 10 to 15 samples per each variable for the studies of the validation of instruments (16); therefore, 350 participants were selected for the present study. The samples were selected through multistage sampling, with the main method of clustering sampling. To do so, the city was divided into three districts, including high, middle, and low districts. Based on the identified blocks in these districts, some blocks were selected randomly, and then some streets and alleys were selected randomly from those blocks. After addressing each family in the identified area, the questionnaire was distributed among the married women.

### 3.2. Data Collection

The Persian version of the domestic violence questionnaire primarily was developed by selecting items from two questionnaires using VAWI and HITS tools that were obtained in the literature review (12, 13) and translated to Persian by the authors of the present study. All questions related to components of physical, psychological, sexual, and economic violence were extracted. Then, a pilot study of a small (30 participant) sample was performed to obtain its psychometric properties. During the pilot study, the translation of some of the items was revised, and at last, the final translated version was investigated and confirmed by eight experienced psychologists in terms of face and content validity. Content validity is a subjective judgment of experts about the degree of relevant construct in an assessment tool. The content validity was evaluated by the content validity index (CVI) and content validity ratio (CVR) (17).

In the next phase, through multistage sampling, the questionnaire was distributed among the married women. The final version of the questionnaire was divided into two sections. The first section included questions about demographic variables, and the second included twenty questions (subscales) on the three components of domestic violence. For each question, the measurement scale was based on the Likert scale (never = 0, rarely = 1, sometimes = 2, often = 3, and always = 4); therefore, the minimum and maximum scores for the present questionnaire was an interval of 0 - 80. The subscales in this instrument were numbered 1 - 20. Data collection was followed by entering it into the software, which applied exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to identify the construct validity of the questionnaire. Construct validity can be regarded as a standard method to assess the validity of a questionnaire (18). In order to evaluate the reliability of the questionnaire, the test-retest method was used in the initial study on 30 married women with a 10-day interval time. Cronbach's alpha was calculated on all samples. The inclusion criteria of this study were ages 16 years and above, being married, willingness to participate in the study, and completing written informed-consent forms. Also, women

who were physically or mentally ill were not included in this study.

### 3.3. Ethical Consideration

The study protocol was approved by the ethics committee of Ilam University of Medical Sciences. The main aims of the present research were explained to all women. All of them entered into this study with informed consent, and all the women signed informed-consent forms. Also, all information related to the participants was confidential. The married women who were not willing to cooperate were excluded from the study.

### 3.4. Data Analysis

The collected data was analyzed using SPSS (version 13) and LISREL (version 8.8) software programs. Data analysis was performed using EFA and CFA. EFA is used when the researcher does not have enough information about the existence of hidden variables; thus, in this type of factor analysis, there is no predetermined hypothesis. CFA is applied to confirm a predetermined hypothesis (18). In the present study, a predetermined hypothesis regarding the components of domestic violence (physical, psychological, and sexual components) was assumed to be confirmed through CFA. To evaluate the suitability of the data for EFA, the Kaiser-Mayer-Olkin (KMO) index and Bartlett's test were used. A KMO index  $\geq 0.6$  was considered as the sufficiency of the samples, and a Bartlett's test result  $< 0.05$  was regarded as the significance of the relationships between the variables for conducting the EFA (18). Besides, EFA was carried out through principal com-

ponent analysis (PCA) and varimax rotation methods. Eigen value  $> 1$  and loading factor  $> 0.3$  for each component were considered as indices for extracting components. The goodness of fit of the CFA model was assessed by the chi-square test, RMSEA, SRMR, RMR (18). The significance level was set at 0.05.

## 4. Results

The response rate of the participating women was reported around 95.5% (334 participants). The mean (SD) age of the participants was  $35.76 \pm 1.05$  years (CI 95%: 34.62 - 36.90). In addition, 28.90%, 21.32%, 19.95%, and 29.83% of the participants had been married for 0 - 5, 5 - 10, 10 - 15, and more than 15 years, respectively. The average scores of the psychological, physical, sexual, and total score of the domestic violence were obtained  $18.12 \pm 11.24$ ,  $14.10 \pm 9.05$ ,  $12.08 \pm 9.15$ , and  $44.47 \pm 10.87$ , respectively. The details of the demographic variables and the mean score of the domestic violence are presented in Table 1.

According to Table 1, most of the participants had education levels of primary and middle school (35.44%) and the primary occupation for most was housewife (70.39%).

According to the content validity results of the domestic violence instrument, the CVI for each of the instrument's items was reported higher than 0.80. The average CVI for all items (S-CVI/Ave) was attained at 0.91. Another index for assessing content validity (CVR) was attained higher than 0.80 for each of the questions.

The items of the instrument, the characteristics of subscales, and the correlation between each question and its components (loading factor) are presented in Table 2.

**Table 1.** Frequency Distribution of Demographic Variables and the Mean of Domestic Violence in Participating Married Women

Variables Classification	Frequency (%)	Mean of Domestic Violence ( $\pm$ SD)
<b>Education status</b>		
Illiterate	50 (15.01)	52.82 (14.21)
Primary and middle school	118 (35.44)	43.28 (10.46)
High school and diploma	113 (33.93)	33.61 (16.41)
Academic	52 (15.62)	32.75 (13.35)
<b>Number of children</b>		
0	63 (19.38)	44.57 (12.56)
1-3	168 (51.69)	43.46 (8.10)
4-7	82 (25.23)	41.94 (17.74)
>7	12 (3.69)	42.11 (12.69)
<b>Occupational status</b>		
Employed	72 (21.75)	39.45 (12.56)
Housewife	233 (70.39)	48.25 (10.68)
Retired	9 (2.72)	32.60 (11.50)
Student	17 (5.13)	44.54 (13.36)

**Table 2.** Characteristics of Instrument Items and Loading Factor of the Domestic Violence Components

Subscales (Questions)	No. (%)	Mean (SD)	Loading Factor of Components		
			Psychological	Physical	Sexual
1. Have you ever received any contempt and rebuke from your husband?	333 (99.70)	2.25 (0.84)	0.83	-	-
2. Has it ever happened that you were not permitted to call and see your friends?	326 (97.60)	3.12 (1.12)	0.87	-	-
3. Have you ever experienced any insult and threat by your husband?	330 (98.80)	2.98 (0.93)	0.84	-	-
4. Have you ever seen any yelling, screaming, and temper tantrums by your husband during your marital life?	334 (100)	3.43 (0.86)	0.46	-	-
5. Have you ever seen any disrespect from your husband during your marital life?	330 (98.80)	3.55 (1.25)	0.85	-	-
6. Have you ever seen any incessant and unreasonable orders by your husband during your marital life?	333 (99.70)	3.08 (0.77)	0.80	-	-
7. Have you ever been afraid of your husband?	334 (100)	3.88 (1.44)	0.87	-	-
8. Have you ever been beaten for any reason by your husband?	319 (95.51)	2.55 (0.56)	-	0.81	-
9. Have you ever experienced slaps by your husband?	322 (96.41)	2.87 (1.02)	-	0.81	-
10. Have you ever experienced any punching and kicking by your husband?	325 (97.31)	2.12 (0.74)	-	0.87	-
11. Have you ever experienced pulling hair and a throwing grip by your husband?	320 (95.81)	2.18 (0.93)	-	0.41	-
12. Have you ever seen your husband slamming the door firmly?	319 (95.51)	1.98 (0.91)	-	0.78	-
13. Have you ever experienced pushing by your husband?	325 (97.31)	3.11 (1.22)	-	0.84	-
14. Have you ever experienced being bitten by your husband?	328 (98.20)	2.55 (0.90)	-	0.83	-
15. Have you ever experienced any physical fracture by your husband?	330 (98.80)	1.22 (0.28)	-	0.42	-
16. Have you ever experienced expulsion from your home by your husband?	325 (97.31)	1.98 (0.33)	-	0.67	-
17. Have you ever suffered in your sexual relations with your husband?	315 (94.31)	3.11 (1.23)	-	-	0.79
18. Does your husband force you to have sex?	310 (92.81)	2.98 (1.12)	-	-	0.81
19. Have you ever experienced violent sexual contacts by your husband?	325 (97.31)	2.68 (0.91)	-	-	0.79
20. Have you ever been to clinics or hospitals due to sexual abuse by your husband?	312 (93.41)	0.85 (0.12)	-	-	0.76

In the correlation matrix between the items studied in each component, most of the correlations were larger than 0.03. Based on Table 2, seven, nine, and four questions measured the psychological, physical, and sexual components, respectively, and each question was strongly correlated to its component (loading factor > 0.4).

In the construct validity of the instrument, the components (factors or latent variables) of the domestic violence were extracted by EFA, and those results are shown in Table 3. Furthermore, the KMO measuring the sampling adequacy was obtained as 0.75, and Bartlett's test was statistically significant (P value = 0.01). The results re-

lated to construct validity and reliability of the questionnaire are presented in Table 3.

According to the results of Tables 2 and 3, the components of domestic violence, including psychological, physical, and sexual violence, explained around 65.99% of the total variance of the domestic violence instrument (Eigen value > 1 showing representative factors). In addition, Cronbach's alpha was 0.83 for the total of components. The findings of test-retest also revealed strong correlations for each component ( $r > 0.6$ ).

Figure 1 shows the scree plot resulting from EFA, which similar to Tables 2 and 3, revealed the representative components of domestic violence with their Eigen values.

In addition, Figure 2 shows the components of domestic violence based on the CFA model.

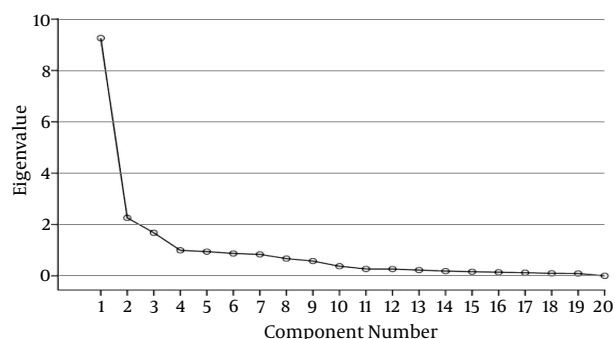
Figure 2 shows that the most important components of domestic violence were psychological, physical and sexual violence. Also, it indicated correlation between each component with the related questions (loading factor). According to Figure 2, questions 1 - 7, 8 - 16, and 17 - 20 were representative of psychological, physical, and sexual violence, respectively. In addition, there were moderate correlations among the components of domestic violence.

The goodness of fit indices in the CFA model were obtained, chi-square = 156, df = 21, P value = 0.1, RMSEA = 0.04, SRMR = 0.03, CF = 0.97 and RMR = 0.04.

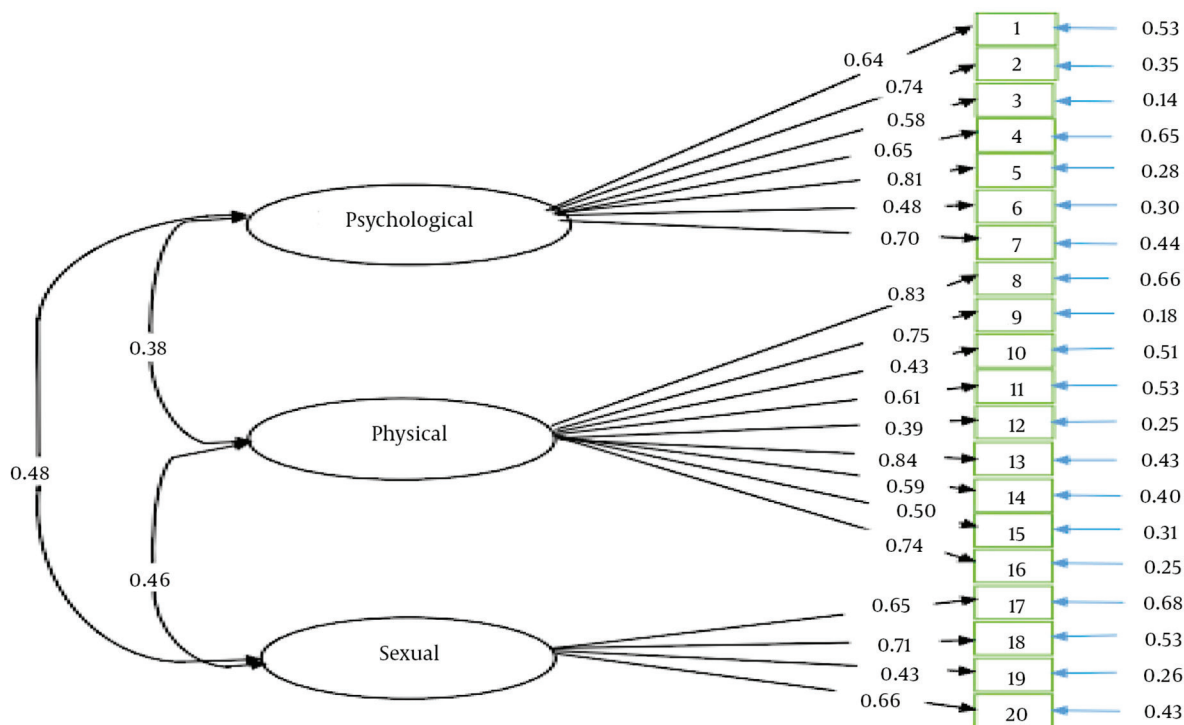
**Table 3.** The Components of Domestic Violence and Reliability Indices Related to the Instrument

Factors	Eigen Value	Variance (CV%) <sup>a</sup>	ICC <sup>b</sup>	Cronbach's Alpha	R <sup>c</sup>
Psychological violence	5.56	27.81 (27.81)	0.73	0.87	0.73
Physical violence	4.73	23.66 (51.48)	0.74	0.89	0.74
Sexual violence	2.9	14.51 (65.99)	0.71	0.8	0.81

<sup>a</sup>Cumulative variance.  
<sup>b</sup>Intra-class correlation.  
<sup>c</sup>Correlation coefficient.



**Figure 1.** Scree Plot Resulting From Exploratory Factor Analysis



**Figure 2.** Confirmatory Factor Analysis of the Domestic Violence Instrument

## 5. Discussion

Domestic violence is a chronic and effectively life-threatening situation that is both preventable and treatable. Studies have indicated that screening and diagnosis for domestic violence improves quality of life and reduces violence-related injuries in the women who suffer in domestic violence situations (12, 14). Therefore, the present study aimed to design and validate the domestic violence instrument using EFA and CFA for screening domestic violence in Iranian women.

Among studies of instruments' psychometric properties, the main methods used to quantify content validity for multi-item instruments are the CVI and CVR, which had desirable values in the present study and were accorded with the previous studies (17, 18). In the present study, the CVI for each of the items was reported higher than 0.80. The average of the CVI for all items ( $S-CVI/Ave$ ) was attained at 0.91. The study results were accorded with the Lawshe table that defined the CVI value 0.75 and higher as a suitable cutoff for assessing content validity (17). The CVR was attained higher than 0.80 for each of the questions. Davis suggests that researchers should consider a CVI more than 0.79 as a desirable index for each item, which our findings met this cut off (17, 18).

According to this study's findings, the three extracted components, psychological, physical, and sexual violence, explained about 66% of the total variance of the domestic violence questionnaire, indicating suitable indices for assessing the validity of this instrument. Psychological violence was more representative (27.81%) compared to physical (23.66%) and sexual (14.51%) violence components. In agreement with our results, the study conducted by Menati in 2011 also showed mental, physical, and sexual violence as the components of domestic violence (19). A study conducted in India also indicated physical, psychological, and sexual violence as the components of domestic violence (19). Overall, most previous researches demonstrated physical, verbal-psychological, and sexual violence as the dimensions of domestic violence (13), which is similar to the findings of the EFA and CFA in the present study.

CFA was conducted for investigating the fit of the three factors with the general structure of the inventory of domestic violence. As a result, the mentioned factors accurately measure the underlying structure of the inventory, and in general, considering the obtained results, it can be concluded that the domestic violence instrument consists of three factors of psychological, physical, and sexual violence. The results of CFA, the same as EFA, indicated that questions have satisfactory correlation coefficient with related components (more than 0.40). The goodness of fit indices in the CFA model were obtained, chi-square = 156,  $df = 21$ ,  $P$  value = 0.1, RMSEA = 0.04, SRMR = 0.03, CF = 0.97, and RMR = 0.04. Often, to investigate the goodness of fit in CFA, the chi-square test is used. The insignificance of the chi-square coefficient ( $P$  value > 0.05) indicates the favorable fit of the inventory (18).

The results of reliability indicators, such as ICC, Cronbach's alpha, and the test-retest correlation, indicated the acceptable reliability of the components of this instrument. Cronbach's  $\alpha$  coefficients attained for the components of the present study were similar to those found in other studies (5, 20). For instance, in the WHO's multi-country study, the Cronbach's  $\alpha$  coefficients were 0.81, 0.77, and 0.66 for physical, psychological, and sexual violence, compared with 0.87, 0.89, and 0.80 in the present study. The values of Cronbach's alpha as 0.7 and larger indicate a suitable internal consistency of the instrument (12, 14). These similarities show a unit internal reliability of domestic violence across countries, in spite of cultural and social differences among the countries (14). Psychometric properties of the WHO tool also provided evidence on the validity and reliability of the instrument and supported its use in domestic violence researches (14). In another study, the self-administered NorVold abuse questionnaire (NorAQ) instrument was validated using the construct validity method by Haddad in Jordan in 2011 (2). In this instrument, psychological, physical, and sexual abuse explained 64.25% of the variance in domestic violence. The Cronbach's alpha was 0.75 for the total scale and 0.75 - 0.77 for its components (2).

In spite of the cultural, linguistic, and social differences between Iranian and Brazilian women, findings from the present study were similar to a study conducted in Brazil in which the attained three components of domestic violence were investigated (21).

The present study was limited to Iranian married women as well as by the willingness of the women to participate in the study. In addition, women who were physically or mentally ill were excluded from the study. This could be a source of selection bias that can be considered a limitation of this study. Also, about 15% ( $n = 50$ ) of the participating women were illiterate, and that could be considered another limitation of the present study since in order for the illiterate women to complete the questionnaire, the questions were asked verbally of them as in an interview. The strong points of this study were, first, the use of combined validating indicators for the determination of psychometric properties of the instrument and, second, the study of three components of domestic violence.

The authors of this study concluded that the used instrument for measuring domestic violence had suitable validity and reliability. The tool can help assess gender-based violence among Iranian women. Also, it is a cost-effective tool for the screening of lifetime domestic violence. However, further research is needed to establish stronger psychometric properties for this alternative form of domestic violence screening in Iran that includes other components of domestic violence (such as economic violence). In general, the psychometric properties of the Iranian version indicated satisfactory results.

Both EFA and CFA supported a three-factor structure for the questionnaire that ensured the original conceptual model of the instrument. Greater consideration is also required to understand and address the types and barriers specific to domestic violence in future studies.

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## Footnotes

**Authors' Contribution:**The data was collected by Aziz Kassani, Walieh Menati and Rostam Menati. Data analysis was performed by Taghi Azadarmaki, Jafar Hassanzadeh and Aziz Kassani. Taghi Azadarmaki, Aziz Kassani, and Walieh Menati contributed equally to writing the manuscript, and all authors participated in revising the manuscript.

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