



The Workplace Bullying in Nurses: A Psychometric Propertises of Iranian Version of Negative Acts Questionnaire-Revised

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Abstract

Introduction: Workplace bullying is a persistent amount of negative conduct which one individual is subjected to by another, and it is emotionally and psychologically aggravating. Nurses are exposed to a greater risk of bullying, due to their direct contact with patients and their associates. The present study aims to investigate the factor structure of Iranian version of Negative Acts Questionnaire-Revised.

Methods: The present methodological study was conducted amongst 400 nurses working in various hospitals affiliated to the Gorgan University of Medical Sciences, over a three month period in 2017. Construct validity of the questionnaire was assessed, and its reliability was also verified for internal consistency, and construct reliability.

Results: Exploratory factor analysis led to the extraction of the following three factors: Physically intimidating bullying, person-related bullying, and work-related bullying. The model's good fit indices confirmed the workplace bullying in nursing tool as follows: PCFI= 0.767, PNFI= 0.721, CMIN/DF= 2.325, RMSEA= 0.081, AGFI= 0.815, IFI= 0.912, and CFI= 0.918. The convergent validity and discriminant validity of the construct of workplace bullying in nursing as well as its internal consistency and construct reliability (>0.7) were confirmed.

Conclusions: The present study results showed that the three-factor construct of workplace bullying in nursing has good validity and reliability. Given its favorable psychometric properties, this questionnaire can be effective in assessing the incidence rate of workplace bullying in the nursing profession.

INTRODUCTION

Disrespectful behaviors in the workplace are threatening and dangerous to the health of both nurses and patients. Such behaviors put the organizational atmosphere at

risk, and can result in many unpleasant consequences if ignored [1]. Bullying refers to any intentional, purposeful, regular, frequent, negative, and annoying

conduct in a mutual relationship, to which one party is subjected to by another, and causes overt and covert harm [2]. Disrespectful (bullying) behavior in the workplace is a complex social phenomenon, which is a combination of organizational and personal factors, but appears difficult to define due to the coexistence of organizations and people [3].

Despite the absence of consensus on the definition of workplace bullying, it is generally defined as annoying interpersonal mistreatments that are systematically repeated and can have adverse effects on a specific individual [4, 5]. Einarsen (2009) has defined dimensions of bullying (work-related factors, person-related factors, and physically intimidating behaviors) with a single construct: "Negative Acts Questionnaire" [6]. The Health Services Union has defined workplace bullying as "humiliation especially in front of colleagues, slander, cursing, undermining, and violent or intimidating behavior" [7, 8]. Various reports are shown many types of workplace bullying against nurses in all of the world [9]. Verbal violence, witnessing disrupted behavior (i.e. any inappropriate behavior, confrontation, or conflict ranging from verbal abuse to physical and sexual harassment) are some examples of workplace bullying [10].

Various forms of offensive behaviors with overt and covert intimidation to embarrassing behaviors such as deliberate and purposeful neglect are considered among bullying behaviors [11-14]. It is worth noting that bullying is different from the quarrel between two physically and socially equal people, and the issue in bullying is in fact the social and physical imbalance [15], and it is different from work stress [16]. People faced with bullying experience, greater anxiety and depression, psychosomatic symptoms, reduced the ability to control affairs, and loss of relationship with others [17, 18]. Bullying is a sign of professional communication failure in the workplace, with consequences far beyond the people involved. Based on various definitions of bullying which have been detailed in previous studies, 2% to 52% of employees can experience very different consequences of workplace bullying [19, 20]. Workplace bullying not only has a negative impact on nurses personally, but can also have a detrimental affect on patient care which is provided by nursing staff [21].

Measuring the workplace bullying needs valid and reliable questionnaire. The most popular tools for the measurement of workplace bullying are DeMarco used Nurse Workplace Behavior Scale (NWS) [22], Leymann Inventory of Psychological Terror-LIPT [6], and Negative Acts Questionnaire-Revised (NAQ-22) [23] were designed for assessing the workplace bullying yet. The NAQ scale has been widely used in studies in Northern European countries, USA and Canada, from 1990 to 2010, and in recent years use of NAQ-R are more prevalent from the previous longer version [24].

Unlike the structure prevalent in many European countries, the structure of many workplaces in Asian countries is vertical and hierarchical, which itself contributes to workplace bullying [25]. Unfortunately, based on the available databases no previous psychometric studies were founded around validating of this tool in Iranian nurses. Therefore the present study was conducted to assess the factor structure of workplace bullying in nursing scale.

METHODS

The present study is a methodological research based approach that was done in 2016. Based on power requirements which are generally regarded as being acceptable, the sample size in studies using a factor analysis approach should be at least 200 subjects, which is then raised to 400 subjects when factor analysis is performed in two stages (200 subjects per stage) [26]. The inclusion criteria, in the current study, were more than two years of work experience, and a minimum of a bachelors degree in nursing. NAQ-R was designed by Einarsen [6, 27]. In order to determine the frequency of the exposure to bullying behaviors, a 5-point Likert scale is used (1 Never; 2 Now and then; 3 Monthly; 4 Weekly; 5 Daily). The respondents are prompted to state how often they have been subjected to the 22 negative acts of the questionnaire, based on their experience in their workplace, over the last six months. Scores range from 23 to 115 points [28]. This is the first time that factor structure of NAQ-R has been assessed in Iran; therefore, the following steps were taken:

Step one: Obtaining permission to use NAQ-R from the designer of questionnaire with contacting via email.

Step two: Preparation of the Persian version of NAQ-R, which included the following stages:

Preparation of Persian version of NAQ-R

1. Translation into Persian

The protocol of the World Health Organization (WHO) round-trip translation method was used to translate the scales from English to Farsi [29]. Two experts in both English and Persian languages, familiarity with the study, separately translated the English version of this questionnaire into Persian, and all Persian equivalents of English words and phrases were recorded. Translators were selected so that one of them was familiar with medical terms and the other was not. Translators were asked to remain faithful to the English text, but avoid literal translation. They were also asked to fully translate the questionnaire and record all Persian equivalents of English words and phrases, so that they can be referred to in the next stage and replaced if needed. Two independent Persian translations were ultimately obtained at this stage.

2. Analysis and Merger of Persian Translations

The two Persian translations and equivalents were reviewed by the research team and translators. They discussed and resolved the differences between the two translations, and prepared a single Persian version of the questionnaire taking into account all equivalents of words and phrases.

Backward translation into English

Two experts in both English and Persian (different from the first two translators) with no knowledge of the English version of the questionnaire or the study stages translated the Persian version obtained in the previous stage back into English.

Analysis and merger of the English translations

The two English translations were combined after assessment and modifications by the researcher to produce a single English version. Both Persian and English versions obtained were sent to developer for confirmation via email.

Assessment of validity and reliability of NAQ-R

1. Construct Validity

Because there was no definite hypothesis regarding the final structure of the factor analysis of this questionnaire, therefore, first, Exploratory Factor Analysis (EFA) was performed to create a hypothesis and then test it with goodness of fit indices in Confirmatory Factor Analysis (CFA) [30]. In the first step, construct validity was assessed to extract the number of latent factors using EFA. Sampling adequacy was assessed using Kaiser-Meyer-Olkin and Bartlett coefficient. KMO from 0.7 to 0.8 is considered as good, and from 0.8 to 0.9 as high [18]. Latent factors were extracted using maximum likelihood with promax rotation. The number of latent factors was estimated using Horn's parallel analysis [31]. Based on the equation $CV=5.152\div\sqrt{(n-2)}$ [20], the presence of one item in the factor was approximately determined at 0.3. Item communalities less than 0.2 of EFA were eliminated [32].

In the second step, CFA was performed using maximum likelihood, and based on Jacard & Van (1996) and Mayers et al. (2005), chi-square goodness of fit index (CMIN), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Normed Fit Index (NFI), Adjusted Goodness of Fit Index (AGFI), and CMIN/Df were assessed [33, 34].

2. Convergent and Discriminant Validity

Convergent validity and discriminant validity were assessed using Average Variance Extracted (AVE) and Maximum Shared Squared Variance (MSV). For convergent validity, AVE should be greater than 0.5, and for discriminant validity, MSV should be less than AVE [22].

3. Reliability

To assess internal consistency of NAQ-R, coefficients of Cronbach's alpha and Omega McDonald's were assessed. Internal consistency greater than 0.7 is considered appropriate [11]. Construct reliability (CR) was also calculated [14, 15]. In fact, consistency of factors is an alternative for Cronbach's alpha in Structural Equation Modelling (SEM) [16].

Normal distribution, Outliers, and Missing data

To assess the normal distribution and outliers data, univariate and multivariate distribution of data were separately analyzed. The presence of multivariate outliers data was assessed using Mahalanobis d-squared ($p < .001$), and multivariate kurtosis defect using Mardia coefficient (higher than 8) [33, 34]. Percentage of missing data was found using Multiple Imputation, then replaced with participants' mean answers. Data were analyzed in SPSS/AMOS24.

RESULTS

Of the total number of participants ($n=400$), 305 were female. The average age of all participants was 31.13 ($SD=7.10$, $CI\ 95: 30.10$ to 32.16). The sampling adequacy index was 0.91, and Bartlett test ($Chi\text{-}Square=2218.71$, $df=171$) ($P<0.001$). Table 1 showed the EFA result of NAQ-R. Results showed that from 22 items of original questionnaire, 19 items were remained and three factors extracted (Physically intimidating bullying, person-related bullying, and work-related bullying) explained 53.56% of variances.

In CFA, first the results of the Chi-square test for goodness of fit were obtained [$\chi^2(144, N=252)=334.84$], and then, to assess model fitness, other indices were found. According to Table 2, all indices, including PCFI= 0.767, PNFI= 0.721, CMIN/DF= 2.325, RMSEA= 0.061, AGFI= 0.815, IFI= 0.912, and CFI= 0.918 confirmed fitness of the final model of first order CFA. According to the final model of NAQ-R as it shown in Figure 1, measurement errors were correlated in items 13 and 11, 11 and 12, 12 and 15, 16 and 18, and 18 and 21.

According to Table 3, assessment of AVE and MSV showed that NAQ-R has unfavorable convergent and discriminant validities, and there is a high correlation among latent factors. Therefore, after the first order CFA, the second order CFA was performed on factors of NAQ-R separately and on the correlation between constructs using SEM to assess whether all these factors can be included in the general concept of bullying or not. Table 2 also shows the second order CFA fit indices compared to the first order model.

Figure 2 shows the structural model of NAQ-R for factor loadings with standardized coefficients. Factor loadings obtained exceeded 0.3 in all items and were significant at less than .05.

Table 1. Exploratory Factor Analysis of Persian Version of the Negative Acts Questionnaire in Nurses

Factors name / Items	Loading	h2	% of Variance	Eigenvalues
Physically Intimidating Bullying			43.330	6.884
Q13. Having insulting or offensive Remarks make about your person (i.e. habits and background) your Attitudes or your private life.	0.883	0.612		
Q11. Spreading of gossip and rumors About you.	0.784	0.646		
Q12. Being ignore, excluded or being "sent to Coventry"	0.580	0.630		
Q15. Intimidating behavior such as finger-pointing, invasion of personal space, shoving, blocking/ barring the way.	0.493	0.482		
Q22. Threats of violence or physical abuse or actual abuse.	0.468	0.395		
Q14. Being shouted at or being the target spontaneous anger (or rage).	0.447	0.581		
Q16. Hints or signal you are from other that you should quit your job.	0.437	0.420		
Person-related bullying			6.583	6.755
Q19. Persistent criticism of your work and effort.	0.867	0.781		
Q18. Being ignored or facing a hostile Reaction when you approach.	0.761	0.708		
Q20. Having allegations made against you.	0.606	0.687		
Q17. Repeated reminders of your errors or mistakes.	0.545	0.449		
Q21. Being the subject or excessive teasing and sarcasm.	0.510	0.670		
Q4. Being given tasks with unreasonable or impossible targets or deadline.	0.411	0.311		
Work-related bullying			3.653	5.532
Q10. Having key areas of responsibility removed or replaced with more trivial or Unpleasant tasks.	0.652	0.507		
Q9. Being ordered to do work below your level of competence	0.651	0.532		
Q7. Being exposed to an unmanageable workload	0.646	0.402		
Q6. Pressure not to claim something which by right you are entitle to (e.g. sick leave holiday entitlement, travel expenses).	0.639	0.404		
Q8. Being humiliated or ridiculed in Connection with your work.	0.604	0.590		
Q2. Having your opinions and views ignored.	0.594	0.370		

Abbreviation: h2: Communalities; Bold cases are for better emphasizing

Table 2. Fit Indices of the First and Second-Order Confirmatory Factor Analysis of the NAQ-R

CFA: Fitting Index			χ^2	df	P-Value	CMIN/DF	RMSEA	PCFI	PNFI	AGFI	IFI	CFI
First order	after	structure	334.84	144	0.001<	2.325	0.081	0.767	0.720	0.810	0.912	0.910
Second order	after	structure	333.82	143	0.001<	2.334	0.082	0.761	0.715	0.810	0.912	0.910

Fitness indexes: PNFI, PCFI, AGFI (>0.5), CFI, IFI (> 0.9), RMSEA (>0.08), CMIN/DF (>3 good, >5 acceptable); Bold cases are for better emphasizing

Table 3. Construct Validity and Reliability Results and the Fornell-Larcker Criterion

	α	Ω	CR	AVE	MSV	Factor 1	Factor 2	Factor 3
Physically intimidating bullying	0.880	0.777	0.881	0.517	0.781	0.719		
Person-related bullying	0.879	0.818	0.891	0.583	0.781	0.695	0.661	
Work-related bullying	0.819	0.812	0.821	0.437	0.483	0.884	0.635	0.764

Abbreviations; α : Cronbach's Alpha Coefficients, Ω : McDonald's Omega Coefficient, CR: Construct Reliability, AVE: Average Variance Extracted, MSV: Maximum Shared Squared Variance,

DISCUSSION

Exploratory factor analysis performed in the present study led to extraction of three factors of physically intimidating bullying, person-related bullying, and work-related bullying, which explained 53.56% of the total variance. Silva et al. (2017) performed a psychometric assessment of NAQ-R among health system employees and reported sample adequacy (KMO) of 0.66 in the men's and 0.84 in the women's groups, respectively. Analysis of data revealed two factors (self-reporting health and job satisfaction), which explained 67.9% of the total variance [35]. Vilija and Lina (2016) performed a psychometric assessment of components of the Lithuanian version of NAQ using Impact of Event Scale-Revised (IES-R). In this 22-item questionnaire, three factors (intrusion, avoidance, and hyperarousal) were extracted, which explained 51.6% of the total variance [36]. Charilaos et al. (2015) conducted psychometric assessment of NAQ among

teachers. Their results revealed four factors (Work-related bullying, Person-related bullying, Physically intimidating bullying and bullying by an individual), which explained 58.15% of the total variance [37]. Lee Y. & Lee M. (2014) performed psychometric assessment of Workplace Bullying in a Nursing-Type Inventory (WPBN-TI). Based on the results obtained from this 16-item questionnaire, three domains were extracted (verbal and non-verbal bullying, work-related bullying, and external intimidations), which explained 60.3% of the total variance [38]. Giorgi et al. (2010) performed psychometric assessment of NAQ-R in universities, hospitals, and companies, and extracted two factors including personal bullying and workplace bullying. By conducting psychometric assessment of the Spanish version of NAQ [39], Jimenez et al. (2007) extracted two factors (physical and occupational bullying), which explained 63.3% of the total variance [40]. In psychometric assessment of the English version

of NAQ, first, two factors (physical intimidation and workplace intimidation) were extracted in 2001 [28].

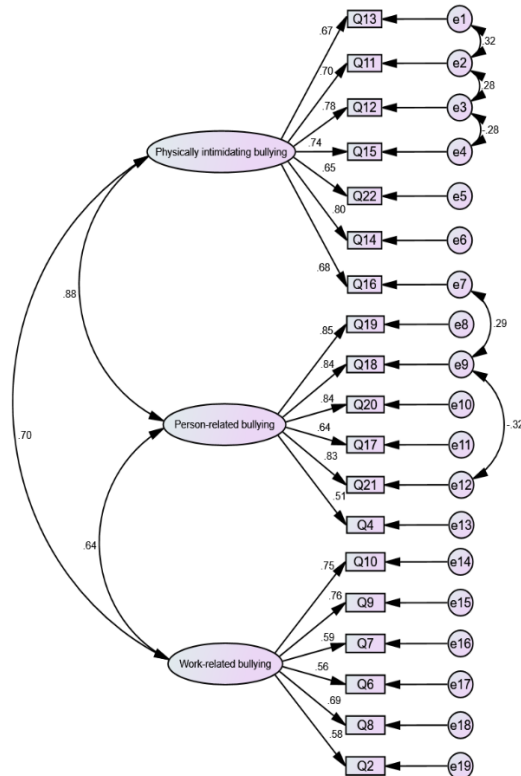


Figure 1. Structure of NAQ-R: Modified Model of First-Order Confirmation Factor Analysis

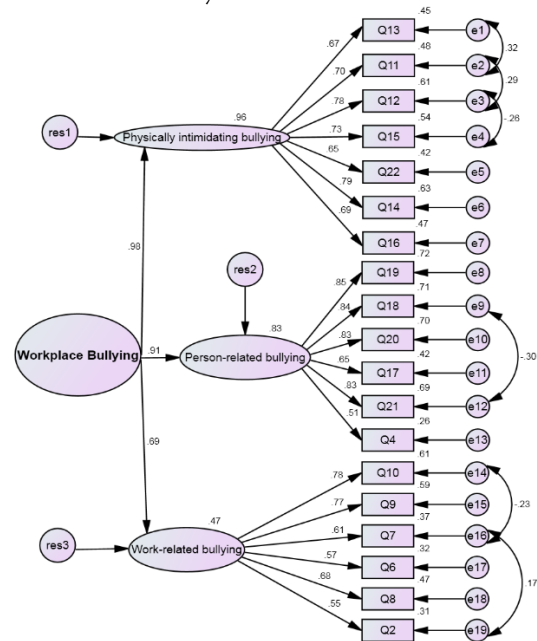


Figure 2. Structure of NAQ-R: Modified Model of Second-Order Confirmation Factor Analysis

Next, the reliability of all items was confirmed with Cronbach's alpha 0.992. According to Table 3, all of the three factors extracted have acceptable internal consistency and CR (>0.7).

Then, in 2009, assuming bullying as psychological intimidation in nursing workplace, authors performed psychometric assessment of the same questionnaire again, and added psychological intimidation factor, which made the questionnaire a three-factor scale [6]. In the 27-item questionnaire of workplace bullying developed by Golparvar et al., the following components were extracted; insult and humiliation, neglect, anger and malice, intimidation and unusual workload, and verbal threats [41].

The first factor identified in NAQ-R referred to the physical intimidation. Physical intimidation refers to behaviors such as insulting, offending, gossiping, violation of privacy, shouldering, blocking, obstruction, threatening with violence, physical harm, becoming a target of anger by colleagues [6, 42]. Almost one-third of nurses in the world are exposed to violence and physical bullying [43]. Bullying affects people's health and leads to physical and psychological harm, posttraumatic stress syndrome, occupational burnout, reduced job satisfaction, and organizational threat [44], and this threat is rather commonplace in psychiatric, geriatric, and emergency wards [43].

The second dimension of NAQ-R was "psychological intimidation in the workplace". As a general term, psychological intimidation includes constant criticism of work, frequent reminding of mistakes, delegation of special-purpose duties, and giving unreasonable or impossible time to perform a task [38]. Nurses exposed

to bullying, display severe symptoms of anxiety and depression [45, 46], and are greatly affected by mental exhaustion, distress, and psychological symptoms [28, 47]. Although mental health and performance of nurses are unconsciously affected by bullying, they prefer to remain silent and share their discontent only with friends [48, 49].

It can be seen from Table 3 that the average of all factors was less than MSV, and convergent and divergent validities were not confirmed, and thus second order confirmatory factor analysis was performed. In a study conducted by Lee et al., (2014) in South Korea, a favorable convergent validity was found for NAQ, which disagrees with the present study results [38]. In 1995, Hair states that the convergent validity exists when the objects of the structure are close to each other and share a large variance together. On the other hand, it has been stated that divergent validity exists when the items of the considered structure or the latent extracted factors are completely separate from each other [50]. In the clearer sense, the appropriate convergent validity would not be possible if the latent factors are not well explained by the extracted clauses and were are not sufficiently correlated [51].

In present study, results of first order CFA confirmed fitness of the final model of Iranian version of NAQ-R. Einarsen et al. (2009) performed psychometric assessment of NAQ-R among employees, and reported RMSEA= .049, CFI= .91, NNFI= .91, and GFI= .98,

which indicated satisfactory model fitness [6]. Dussault & Frenette (2014) assessed workplace bullying and loneliness using NAQ-R, and reported goodness of fit with CFI= .99, NNFI= .99, and RMSEA= .049, which showed that the model was good for fitness of data [52]. Giorgi et al. (2011) assessed workplace bullying in Italian society using NAQ-R, and reported model fitness indices: GFI= 0.92, CFI= 0.91, RMSEA= 0.07, RMR= 0.03, and IFI= 0.91, which showed favorable model fitness [39] and agrees with the present study results. However, disagreements cannot be overlooked. Tsuno et al. (2010) assessed validity and reliability of the Japanese version of NAQ-R with goodness of fit criteria including GFI, AGFI, CFI > 0.9, and RMSEA < 0.0538, and reported GFI= 0.86, AGFI= 0.83, CFI= 0.87, and RMSEA= 0.087, which showed unfavorable model fitness [25].

According to the final model of NAQ-R, measurement errors were correlated in items 13 and 11, 11 and 12, 12 and 15, 16 and 18, and 18 and 21. Self-reported measurement method may cause measurement errors. Conversely, measurement errors can be the consequence of using similar words and expressions in both positive and negative statements [53]. Correlated measurement error can be used as a scale reduction technique to finalize and then confirm final structural scale [54].

In the present study, internal consistency and reliability coefficients of the bullying construct showed that the construct has a favorable reliability. DeMarco (2002) performed psychometric assessment of violence in nursing, and found intercorrelation range of 0.86-0.94 [22]. In a study conducted by Lee (2014), reliability of NAQ was found 0.89 [38]. Einarsen (2001) found Cronbach's alpha coefficient of 0.92 for NAQ [28]. Cronbach's alpha was taken as .86 in another study [55].

Advantages and Limitations

One of the main features of SEM is reducing measurement errors, which shows the causal relationship between first level latent variable with greater clarity. SEM measures the unexplained part of variance in measurement (namely, residual error) [56] that this method was used in this study. But present study have some limitations. Major limitation about this study was the undesirable results from convergent and divergent validities. So more studies should run around this issue. The researchers of this study have ensured that the forward-backward translation method was performed at a high standard, and the original author of the scale confirmed the accuracy of the translation. Apart from this confirmation, there's always the potential of using a scale that was originally designed for a different population. Cultural differences and language

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nuances may not be translatable, and test users would be advised to remain cognizant about this potential issue.

Implication of the results

Considering the importance of a comprehensive approach to nurses in health care centres, the existence of such a tool can help to accurately measure workplace bullying in nurses thereby improving the quality of care delivered and the quality of patient's life. Also assessing the workplace bullying in future can be helpful to protect the nurses (especially mental issues), because nurses are suspect to bullying from patients or other medical workers (due to large contact with them).

CONCLUSION

The results of this study demonstrate that the NAQ-R enjoys sufficient validity. Based on EFA the questionnaire had three independent factors and also the model's good fit indices confirmed the EFA results. Reliability of NAQ-R was proved with special coefficients. A significant percentage of the variance can be explained based on Iran's cultural context.

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AUTHOR CONTRIBUTION

HSN, SK, SG, and MC contributed to intellectual content and study design. HSN, SK, SG contributed to data collection. HSH run the data analysis. AHG, HSN, SK, SG, and MC wrote the first draft. HSN, AHG, and MC contributed to critical revision of manuscript. All of the authors accepted the final version of manuscript.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICAL CONSIDERATIONS

The present study is the result of an approved research project by Golestan University of Medical Sciences (No: 95 _ 165032). Ethics committee of Golestan University of Medical Sciences assessed and proved this study (IR-GOUMS.REC.1395.168). Before commencement, nurses were briefed about the study objectives, and signed informed consents. All participants were assured of the confidentiality of data. Also the copyright permission was obtained from the developer of this scale to reproduce it in Persian language.

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