International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

Psychometric Evaluation of the Nursing Burnout Scale Short : Form: Persian Version

[1]MohammadAli Vakili, [2]*Shohreh Kolagari

Abstract- *Burnout is a syndrome of emotional, psychological and physical exhaustion, which is defined by the development of negative attitudes toward job. Although nurses are constatly exposed to various degrees of psychological and physical stress related to their workplace, assessment of this issue requires development of a dedicated tool which is concordantwith the culture of each community. The aim of this study was to evaluate psychometric properties of the Nursing Burnout Scale (NBS-short form) in an Iranian population.This study was done on 637 nurses working in 16 hospitals who were selected via stratified probability sampling. The original version of the scale included 65 items in five domains, which was translated to English using the foward-backward strategy. Face validity, content validity and construct validityincluding exploratory factor analysis (EFA) and confirmatory factor analysis (CFA)of the scale were evaluated. Moreover, reliability of the scale was assessed by calculating Cronbach's alpha.Data were analyzed by SPSS- 16 and AMOS-22.In the EFA process, considering factor loading of ≥0.3 and Eigen value of >1, coping domain was elminited from the factor model structure. After the CFA and goodness-of-fit measurement, the Persian version of NBS was approved with 47 items in four domains. The reliability of the scale was satisfactory with Cronbach's alpha coefficient of 0.93.The Persian version of NBS is a valid and reliable questionnaire for measuring job burnout. The scale can accurately predict actual problems related to nursing burnout in Iran. The reports produced by this scale can be utilized by the health system for strategic planning and development of preventive and supportive policies.*

Keywords-*Job burnout, Nursing, Psychometrics Scale*

I BACKGROUND

Characteristics of a work environment and numerous external and internal factors are considered sources of stress in the workplace (1). Environmental stressors such as noise, crowdedness and light, as well as interpersonal and organizational conflicts, workload, role ambiguity, wrong policymaking and professional challenges may expose the staff to physical and mental strain (2). Severity and constant contact with the stressors have physical and psychological consequences, such as feeling tedious, reduced job efficiency, fatigue, frustration and discouragement, and eventually burnout (3).

Job burnout is a broad and multidimensional concept, which is defined by development of negative attitudes toward job and the lack of attention (4). In 1970sFreudenbergwas the first to introduce this concept to the clinical psychology research, asa syndrome of physical and psychological exhaustion (5).Although this term isused to

[1]*Associate Professor of Biostatistics, Health Management and Social Development Research Center, Department of Biostatistics and Epidemiology, Faculty of Health,Golestan University of Medical Sciences, Gorgan, Iran.*
[2]**Assistant Professor, Nursing Research Center, ,Golestan University of Medical Science. Sciences, Gorgan, Iran, kolagari_gorgan@yahoo.com*

DOI: 10.37200/IJPR/V24I4/PR201087
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

describe tension and occupational fatigue in all professions, the intensity of burnout may be higher in stressful jobs, such as dentistry, social work, health care, physiotherapy, teaching, medicine and nursing (6).

Professional nursing is associated stressful work environment. Nurses are constantly dealing with various levels of stress (7). This causes emotional and physical exhaustion that negatively affects health, energy level,performanceand morale, thus leading to incompatibility with coworkers, absentees and job change(8, 9). Extensive research on more than 700 hospitals in the US, the UK, Canada and Germany showthat nurses have higher burnout rates than other healthcare workers(10).The incidence of burnout in nurses has been reported to be between 2-10% (11).

Nursing is a care-oriented career and the stress caused by nursing tasks or procedures particularly in the emergency department, can lead to stress and subsequently burnout.Meanwhile, it is essential to ensure the mental and physical well-being of nurses and improve their professional performance in the health system.Accordingly, it is essential to use specific scales for accurate and timely diagnosis of burnout. In other words, the use of specialized nursing burnout assessment scales help determine the exact burnout level, which can be utilized for preventing health problems in nurses and the reduced quality of care provided in the healthcare system.

Although various general burnout assessment scales such as the Jones Staff Burnout Scale, Pines Burnout Measure and Copenhagen Burnout Inventory for health professionals have been used in studies(12), Theses cannotcapable of fully addressing the problems of the nursing profession. The Maslach Burnout Inventory has been the most widely used scale for measuring burnout in nurses in Iran(3, 5, 13-17). Despite, this inventory focuses on psychological domains such as emotional exhaustion,depersonalization and lack of personal accomplishment(18),as a general scale cannot cover all underlying aspects of nursing burnout. Therefore, it is necessary to assess this issue using specificscalessuch as Nursing Burnout Scale that can accurately determine the aspects of this problem. In other word, in order to measure burnout in nurses, we needed a specific nursing questionnaire that could show all aspects of burnout problems.

II OBJECTIVE

Considering the importance of jobburnout assessmentin nurses with a specific and localized scale in nurses,the purpose of this study was to evaluate the psychometric properties of a nursing burnout scale among Iranian nurses.

III METHODS

This methodological study aimed at determining the psychometric properties of the Nursing Burnout Scale-Short Form (NBS-SF) among nurses working in hospitals affiliated to the Golestan University of Medical Sciences, Iran. The study was designed to first assess translation and cultural adaptation of the scale, and then evaluate its face validity, content validity, constructvalidity and reliability. The NBS-SF is a 65-item scale with five main domains; organizational antecedent (4 subscales), burnout (3 subscales), hardy personality (3 subscales), coping (3 subscales), and consequences (4 subscales).

DOI: 10.37200/IJPR/V24I4/PR201087
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

3.1.Ethical Consideration

This article was derived from a research project approved by the ethics committee of Golestan University of Medical Sciences (Code: IR.GOUMS.REC.1394.193).Written consent was obtained from all subjects after explaining the study objectives.

3.2.Translation and cultural adaptation stage

First, we obtained permission from the designerof the original scale (Professor Garrosa) for translation and modification of the scale. Translation is a common method for cultural adaptation or localization of a scale. Thus, accurate and correct translation process and cultural adaptation of meanings will maintain the scale's credibility and reliability (19). It is believed that there is no standard instruction for translating questionnaires (20).In this study, we used the method proposed by Wilde et al. (2005), which includes translation of the questionnaires from the original language into the target language, integration of initial translations into a final version, reviewing the translated version, obtaining comments, revision, and finalization(21). First, two experts translated the original version of the scale into English. Then, the research team reviewed the translations, made minor corrections, and prepared a single copy. Later, blind back translation was made by oneother expertin the English and Persian languages to ensure the accuracy of the first translation.Subsequently, the research team with help of a psychologist adapted and verified the conformity of meaningsin the translated and the original versionof the scale. After obtaining approval from the scale's designer, the Persian version named pre-NBS-P, was prepared for face, content and construct validity and reliability assessment.

3.3.Face validity

The face validitywas assessed both quantitatively and qualitatively. The quantitative face validity was determined using the following formula:

Impact score= Frequency (%) × Importance.

The pre-NBS-P was given to 18 nurses (9 women and 9 men) working in general and specialwards of the hospitals. The subjects were asked to comment on the 65 items based on a Likert scale (very important=5 to not important=1).To assess the qualitative face validity, the target group was also asked to express their opinions about fluency, simplicity and clarity of the items(22).

3.4.Content validity

For quantitative evaluation of Content Validity Index (CVI), 12 experts in the fields of nursing, management and psychology were asked to review the pre-NBS-P in terms of relevance, simplicity and clarity using a 4-point Likert scale (from not relevant to highly relevant). The CVI was calculated for each itembased on the following formula;CVI= the number of experts providing a score of 3 or 4 divided by the total number of experts(23).According to Waltz and Bausell, items with CVI scores of< 0.7 are unacceptable, 0.7-0.78 needmodification, and ≥ 0.79 are acceptable(24).

DOI: 10.37200/IJPR/V24I4/PR201087
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3.5.Construct validity

Exploratory and confirmatory factor analysis

Exploratory factor analysis (EFA) was performed to explore the existing structural model, and then Confirmatory Factor Analysis (CFA) was carried out to validate the model in the Iranian research community. Construct validity evaluates the adequacy of the tool for measuring existing constructs, and factor analysis is one of the most important steps for construct validity testing and designing new tools(25).

According to the rule of thumb, in the EFA, 5 to 10 subjects are common for each sentence (26). In this study, the subjects were selected via stratified probability sampling. For 65 items, the minimum and maximum number of subjects was calculated as 325 (65×5) and 650 (65×10), respectively.Inclusion criteria included willingness to participate in the study, employment as a nurse in the ward for at least six months, lack of critical conditions such as immigration, mourning, etc. In exclusioncriteria, nurseswho participated in the qualitative and quantitative face validity and completed the questionnaire were excluded from the construct validity. The construct validity was approved considering the maximum sample size for the pre-NBS-P self-report questionnaire, and consent form was taken from all subjects after explaining the research objectives. Among 650 nurses, 637 completed and returned the questionnaire (response rate= 98%). Of the 637 returned questionnaires, 325 samples were assigned for EFA and 312 samples were assigned for CFA using simple random sampling. It should be noted that at least 300 specimens are required to perform CFA (26).

EFA was performed using the SPSS-16. After collecting the data, the Kaiser-Meyer-Olkin (KMO) test was performed to evaluate sampling adequacy, and the Bartlett's test of sphericity was used to calculate the correlation matrix.After extracting the main components, the items and the EFA-derived model, CFAwas performed using the AMOS-22 to check whether the model fits the data. The following goodness of fit indices were used to measure fitness between the hypothesized model and the observed covariance matrix: the Parsimonious Comparative Index of Fit Index, the Parsimonious Norm of Fit Index, the Goodness-of-Fit Index (GFI), the Root Mean Squared Error of Approximation, the minimum discrepancy divided by its degrees of freedom, Comparative fit index, and Normed fit index(26).

3.6.Reliability

The internal consistency method was used for reliability testing. Reliability means the stability and internal consistency of a scale in repeated and multiple measurements. The internal consistency was measured by calculating the Cronbach's alpha coefficient of the questionnaire (Cronbach's alpha values ≥0.7 are acceptable)(27).

IV RESULTS

Mean age of the subjects was 33.2 ± 0.28 years, and mean work experience was 8.1 ± 0.25 years. Most of them were women (85.4%) and had permanent employment(43.2%), while 56.4% had casual employment. In addition, 97.2% subjects had an undergraduate degree and2.8% had a Master’s degree. Moreover, 90.2% subjectshad worked a rotating shift.

DOI: 10.37200/IJPR/V24I4/PR201087
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4.1.Face and Content Validity

Based on the viewpoints of the target group, ambiguity in the concept of statements #60, #61, #25 and#28 was resolved, and the target groups verified the qualitative face validity. When calculating the impact score, only two statements (# 9 and #23) scored less than 1.5. This issue was resolved by replacing the word 'systematically' with 'regular' in statement 9, and replacing the word 'burnout' with 'exhausted' in statement 23.

When evaluating CVI, 12 statements scored less than 0.79, nine (#41, #2, #43, #44, #45, #46, #47, #48, #49) of which were related to the Coping domain and three (#12, #8, #37) were related to the Hardy personality and Organizational antecedent's domains. At this stage, three other experts were asked to comment on all 12 statements. Ultimately, only three statements (#37, #8 and #12) were maintained and the other nine related to direct coping were deleted. The CVI scores for relevance, clarity and simplicity were 82.5%, 95% and 92.4%, respectively.

4.2.Exploratory Factor Analysis

EFA was performed to explore the existing structural model, (Table1)and then CFAwas carried out to validate the model in the Iranian research community.

Table 1: Results of the Bartlett's Sphericity test and the KMO index for the pre-NBS-P, based on the domains

NBS	KMO	Bartlett's	df	Sig
Organizational Antecedents	0.757	1109.994	120	0.000
Burnout	0.852	1332.081	66	0.000
Hardy Personality	0.835	1228.808	66	0.000
Coping	0.6355	457.261	36	0.642
Consequences	0.933	3437.778	120	0.000

As shown in table 1, except for the coping domain, most of the domains were eligible for EFA.

At this stage, in order to achieve an optimal structural model, EFA was performed multiple times with different factor loadings. Finally, by taking into account a factor loading of ≥0.3, the statements with more important and useful concepts were maintained. Moreover, the number of factors was calculated based on Eigen value of >1(Table 2).

Table 2: Results of EFA after varimax rotation

Domain	Items	1	2	3	4
Organizational Antecedents	**Work Overload (Wo)**				
	I have work in excess due to the quality of my patients(7)	0.807			
	I feel an overcharge in my work due to the shortage of personnel (3)	0.789			
	I believe that I have too many tasks to realize	0.744			

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	simultaneously (1).				
	I have to attend too many patients(13)	0.450			
	Contact with the death and pain(Cn)				
	It affects me to see a patient dieing with whom .I have spent the process of the disease (10).		0.724		
	I am affected by seeing a relative of a patient suffering(5)		0.715		
	The death of a young patient affects me a lot (15).		0.658		
	It hurts me that the patients do not receive .visits of their relatives (4).		0.575		
	Troubled interaction (Tr)				
	The doctors speak to me in authoritarian tone (12).			0.793	
	The doctors do not give us support, they are afraid that we take their protagonist (11).			0.784	
	The doctors make us responsible of their own mistakes (14).			0.703	
	The patients / relatives blame us what happens to them(16).			0.525	
	Ambiguity of role(Am)				
	The orders that my Superiors give me are slightly regular (9).				0.735
	The information of how to take to end my work, on the part of my superiors is slightly clear (6).				0.669
	I believe that the planification of my work is clear (2).				0.518
	The orders given to me are vague and ambiguous (8).				0.494
Burn out	**Emotional exhaustion (Em)**				
	I feel exhausted with my work (23).	0/807			
	I feel that the everyday work in the hospital is a burden for me (24).	0/792			
	I feel burnout after a day of work (27).	0.760			
	In my work, often I feel emotional and physical exhaustion (20).	0.748			
	Nobody considers me, I feel like “a maid for everything "(17).	0.581			
	Depersonalization(De)				
	I try to depersonalize the relationship with the relatives of the patients to the maximum, and if it is possible I avoid the contact (21).		0.714		
	With regard to my patients, I do not involve myself in their problems; it is as if they do not exist (22).		0.714		
	When the patients do not improve I try to do my work as rapid as possible and try to avoid the contact with them (19).		0.647		
	I believe that I am moving away emotionally from my patients (18).		0.416		
	Lack of personal accomplishment(La)				
	I feeluseless (28).			0.850	
	I feel that my work does not serve for			0.812	

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	anything (25).				
	I feel that my self-esteem is so down (26).			0.750	
Hardy Personality	**Challenge (Ch)**				
	Still when it supposes major effort, I choose the works that suppose a new experience for me (34).		0.787		
	In my work the innovations attract me preferably in the procedures(37).		0.762		
	I think that the work that I realize is of value for the society and it is important for me to dedicate all my efforts(30).		0.684		
	When it is possible I try to have new experiences in my daily work (40).		0.570		
	I try to be resistant to work problems (36).		0.440		
	My daily work satisfies me and makes me totally devote to it(29).		0413.		
	Control (Co)				
	The majority of the times it is not worth that I strain since whatever I do, things don't work out well(38).			0.834	
	Though I do a good work I will never reach the goals (39).			0.805	
	I do not strain in my work, since, of any form, the result is the same (35).			0.761	
	Though I strain I do not obtain nothing at all (32).			0.727	
	I am really interested and identified with my work (33).			0.520	
	Frequently I feel that I can change what might happen tomorrow across what I am doing today(31).			0.416	
Consequences	**Psychological consequences (Ps)**				
	I feel always overexcited (65).	0.840			
	I have had longing for crying, for running or to hide (64).	0.747			
	I am obviously nervous and on the verge of "exploiting" constantly(63).	0.589			
	Physical consequences(Ph)				
	I have had muscular problems (60).		0.860		
	I have endured frequent motion sicknesses(61)..		0.814		
	I have had the sensation of not wellbeing(59).		0.775		
	I have felt exhausted and without forces for nothing(62).		0.736		
	The work is concerning unfavourably my health(58).		0.632		
	Social-family consequences(So)				
	My work imposes on me a familiar restricted life(52).			0.816	
	My work turns me irritably with the family			0.658	

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(51).				
My work makes me to leave of side other activities (55).			0642.	
My profession is affecting negatively my relations out of the work (57).			0.578	
Organizational consequences(Or)				
I have had desires to leave the profession (54).				0.838
Often, I have the desire of changing profession (50).				0.793
Often, I have had thoughts of abandon of my (work (53).				0.758
If I could (if I had labour and economic safety), I would change profession (56).				0.698

The results showed that most of the pre-NBS-P domains explained more than 60% of the total variance.(Table3)

Table 3: Percentage of variance explained for each factor after the varimax rotation

Domain	**Subscale**	**Eigen Value**	**Percentage of variance**	**Cumulative percentage of variance**
Organizational Antecedents	Work Overload	3.64	14.095	14.095
	Contact with the death and pain	2.06	13.851	27.945
	Ambiguity of role	1.47	13.695	41.640
	Troubled interaction	1.22	10.960	59.670
Burnout	Emotional exhaustion	3.84	25.445	24.899
	Depersonalization	2.31	21.283	46.319
	Lack of personal accomplishment	1.05	14.328	60.149
Hardy Personality	Challenge	3.84	28.352	49.951
	Control	2.31	22.971	61.323
Consequences	Psychological consequences	8.24	23.885	23.885
	Physical consequences	1.69	19.513	43.398
	Social-family consequences	1.10	16.288	59.686
	Organizational consequences	1.08	13.931	73.617

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After determining the model in the pre-NBS-P, theresults showed that the structural model of burnout used in the Iranian nursing research community was different from the original version, and the coping domain was deleted (with 9 items). In statement #17, the‘lack of personal accomplishment subscale’ was moved to the ‘emotional exhaustion subscale’. In addition, statements #31 and #33 were alsomoved to the control subscale, and statements #29 and #30 were moved from the commitment subscale to the challenges subscale, all of which resulted in the removal of the commitment subscale. Finally, statement #62 was moved from the psychological consequences to the physical consequences.

4.3. Confirmatory Factor Analysis

After removing the coping domain, the pre-NBS-P was subjected to CFA with 56 items in four domains. CFA was conducted usingthe AMOS software.The organizational antecedents and the Hardy personality domains were analyzed only in the first-order analysis. In the analysis based on factor loading index of >0.5 in each subscale, statements#4 and #5 in the ‘contact with death and pain’ subscale, statements #2 and #8 in the ‘role ambiguity’ subscale, and statement #16 in the ‘troubled interaction’ subscale was removed. Moreover, statements #29 and #30 in the ‘challenges’ subscale, and statements#31 and #33 in the ‘control’ subscale was deleted. These two domains were not eligible for second-order analysis due to lack of a default entry. (Figure 1) Two domains of burnout and consequences were verified with second-order analysis, and all statements were maintained in the subscales. (Figure 2)

The Persian version of the scale was confirmed based on the results of Goodness-of-Fit indices for all four domains. (Table 4) At the end of construct validity evaluation, of the 65 statements in the original scale, 18 statements were removed, leaving the final version of the NBS-P with 47 items.

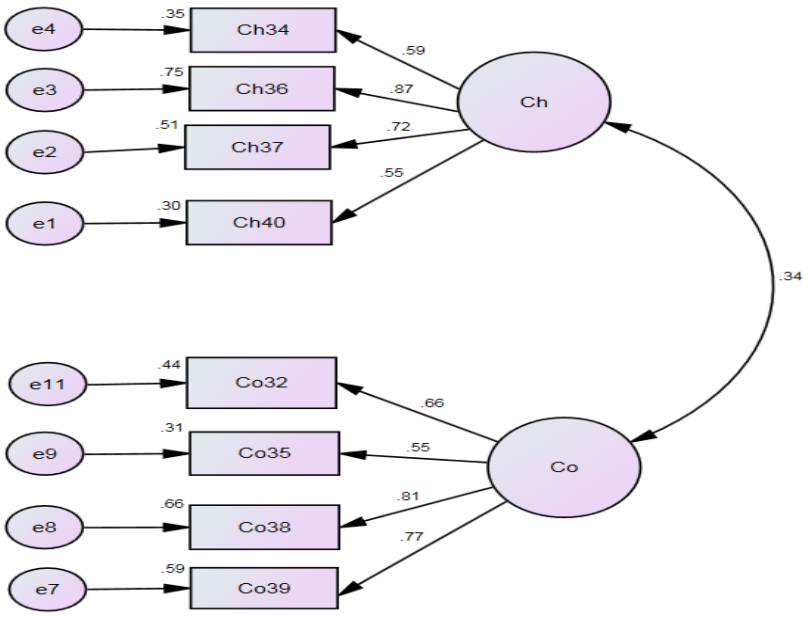

Figure 1: First-order CFA for the Hardy personality domain and organizational antecedents’ domains

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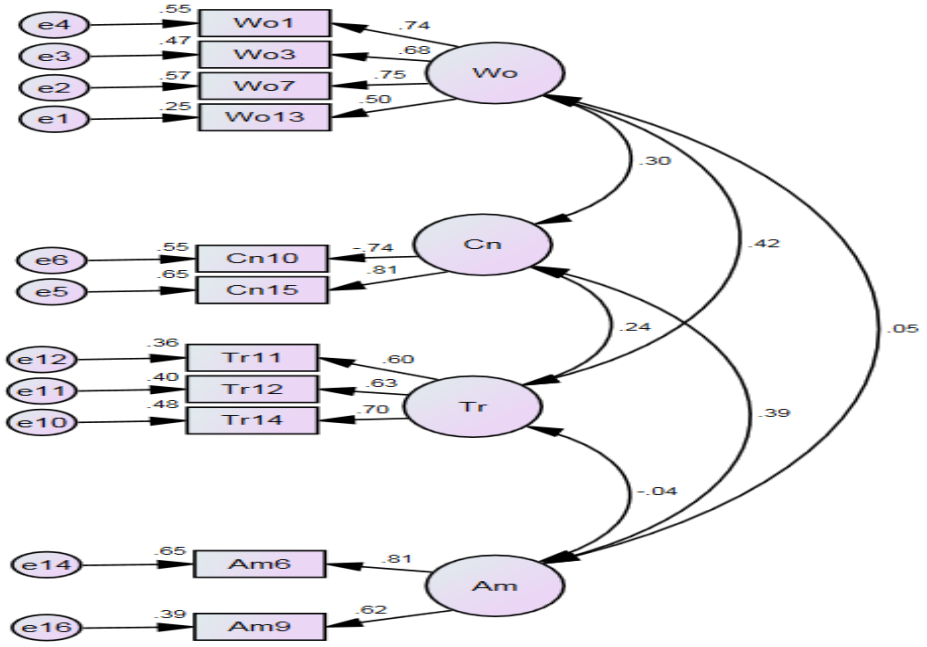

Figure 2: Second-order CFA for the Burnout domain and Consequences domains

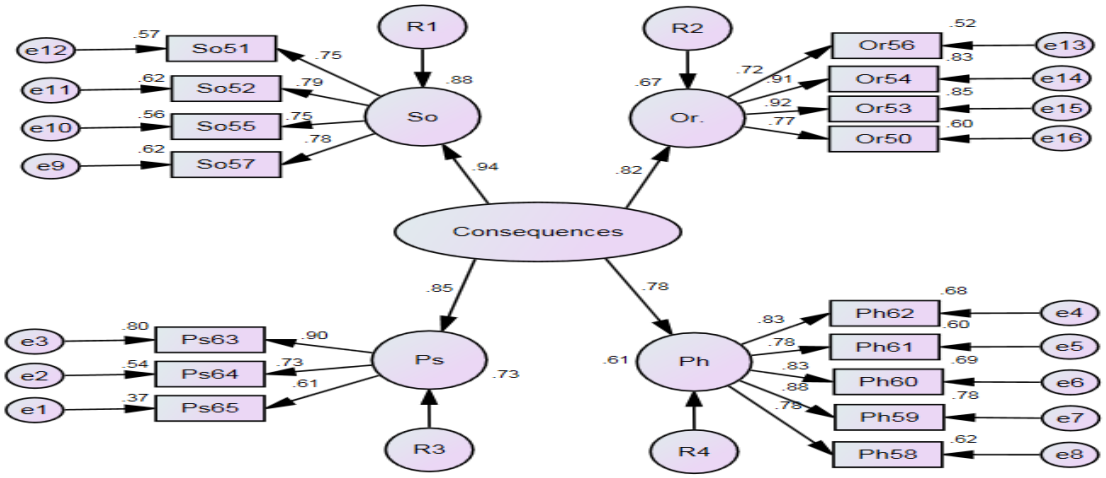

Figure 3: Consequences

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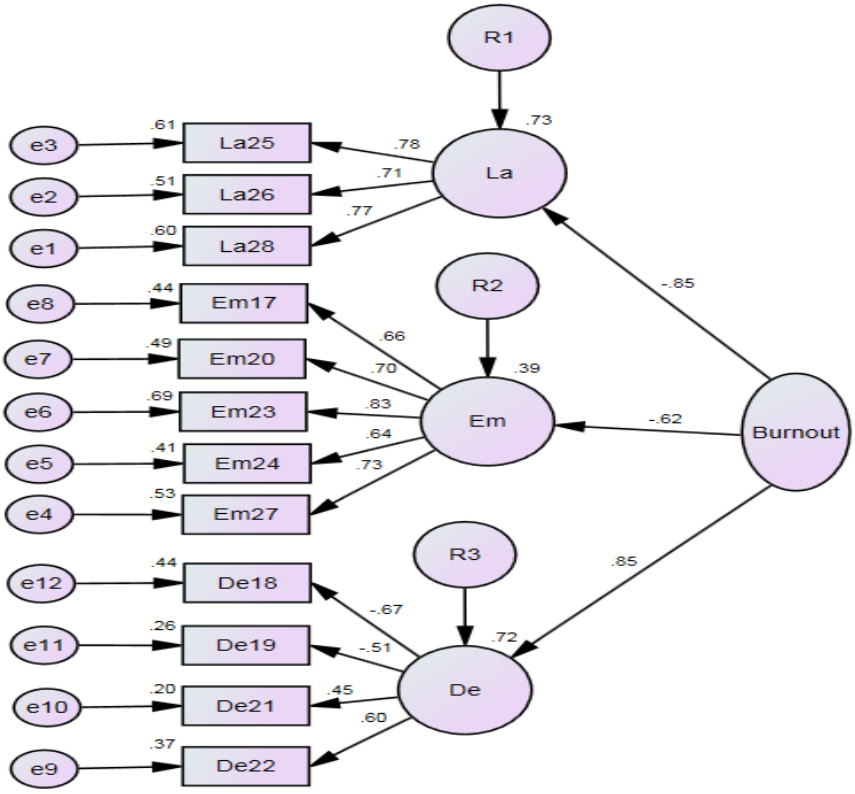

Figure 4: Burnout

Table 4: Results of fit indices for the pre-NBS-P model

Sub Scale	NFI	CFI	CMIN/ DF	RMSEA	GFI	PNFI	PCFI
Consequences	.906	.932	3.374	.087	.883	.755	.777
Hardy Personality	.945	.978	1.870	.053	.971	.647	.663
Consequences	.906	.932	3.374	.087	.883	.755	.777
Organizational Antecedence	.912	.945	1.935	.055	.959	.630	.659
Burnout	.564	.645	2.900	.078	.921	.436	.498

4.4.Reliability

Reliability of the final version of NBS-P was assessed and an alpha coefficient of 0.93 was achieved for the domains (0.71-0.93). The results showed that the internal consistency reliability of the statements in all domains is acceptable. (Table 5)

Table 5: Results of reliability assessment for the final version of NBS-P

Domain	α	Subscale	N	Items No

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Organizational Antecedents	0.71	Wo , Cn, Am,Tr	11	1,3,6,7,9,10,11,12,13,14,15
Burn out	0.83	Em ,De ,La	12	17,18,19,20,21,22,23,24,25,26,27,28
Hardy personality	0.76	Ch ,Co	8	32,34,35,36,37,38,39,40
Consequences	0.93	Ps,Or,So,Ph	16	50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65

V DISCUSSION

The present study was conducted to determine the psychometric properties of NBS-SF. We successfully performed scale development for the original tool, and therefore verified the NBS-P as a valid and reliable tool for measuring burnout in nurses in Iran.The translation process and the cultural adaptation of the scalewere carried out successfully based on the Wilde et al. (2005) method(21).This was in line with Pisanti et al and Chen et al(28).Carrying out these stages systematically and based on a specific patternwould ensure the accuracy of the results.The face validity was approved by considering the views of target groups, making minor changes to some statements, and calculating the impact score. In the content validity, based on the panel of experts' viewpoint, 12 statements with the lowest CVI scores in the relevancy criterion were re-evaluated, and only 3 statements were maintained. According to Severinsson, translation and cultural adaptation of a questionnaire's statements are critical, but it can create methodological problems in the content validity(20). Although nine statements were to be removed after the content validity, the decision was not made until performing the construct validity to obtain a more convincing rational for removal of the statements. Factor analysis is a credible technique for assessment of construct validity, which allows researchers to modify tools(28). We observed a 98% response rate in the construct validity assessment. According to Polit and Beck, a response rate of over 50% is essential in research (24). In the EFA, the results of Bartlett's sphericity test and the KMO index were acceptable for all main domains except for the coping domain, which fell short to achieve the minimum acceptable score in the sampling adequacy test. After repeated analysis of different factor loadings, we determined Eigen of >1 and factor load of ≥0.3, which have been also used in other studies(28). After extracting the main components in the EFA,the results revealed that exceptfor the organizational antecedents domain,most domains explained≥60% of the total variance, which is considered adequate (29). Although the total variance in organizational antecedents was less than acceptable (59.6), researchers accepted it unanimously.

In the EFA process, the results showed that statement #17 from the subscale of lack of personal accomplishmentwas moved to the emotional analysis subscale, which was not observed in similar studies(12, 30). Transference of statement 17 with negative emotional load in to the emotional exhausted subscale indicates the is the importance of this concept in Iranian nurses Maslach also believes that emotional exhausted is a key concept in burnout(31).

DOI: 10.37200/IJPR/V24I4/PR201087
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Following the EFA process, some of the statements from the commitment subscale were moved to the control and challenges subscales, which led to complete removal of the subscale of commitment. Generally, replacement of the statements from subscalesthat poorly contribute to explaining the total variance is more anticipated (32).The organizational Antecedents,social-family and physical and psychological consequences seem to be among the factors that can contribute to burnout in Iranian nurses. In a similar study, Matejic et al. also emphasized on the importance of explained variance and the weight of each statement in EFA(28). After extracting the EFA-derived model, the researchers examined all possible models with help of the AMOS software. The pre-NBS-P was analyzed with both the first-order and second-order approaches. The organizational antecedents and the Hardy personality domains were subjected only to the first-order analysis.Presence of at least three items in each subscale was a prerequisite for the second-order CFA, but some of the subscales only had two items. Moreover, the terms that had been moved from the challenges and control subscales, were deleted following CFA. Therefore, it seems essential to perform EFA prior to CFA since the two methods are complementary to each other. Cabrera Nguyen believes thattracking the results of EFA by CFA is a common approach for scale development and validity testing(33).Contrary to a number of previous studies, in this study, we conducted complete construct validity in two steps (EFA and CFA) and measuredfitness indices (11, 28, 34).We also found the internal consistency of the final NBS-P to be satisfactory (Cronbach's alpha=0.93), which indicates the suitability of this scale for assessment of burnout in Iranian nurses. Munroclaims that careful consideration of EFA and CFA and fitness of the factors in the study population would guarantee a high level of internal consistency reliability(26). Streiner and Norman have also emphasized on the association of internal consistency with homogeneity of tools(35).

VI CONCLUSION

Based on the results, the final version of NBS-P (with four domains, 47 items) is a valid and reliable questionnaire for measuring job burnout in nursing in IRAN. The scale can accurately predict actual problems related to nursing burnout in Iran. The reports produced by this scale can be utilized by the health system for strategic planning and development of preventive and supportive policies.

VII ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to all participants. The support from the Deputy of Research of Golestan University of Medical Sciences is also gratefully acknowledged.

CONFLICT OF INTEREST

None

VIII REFERENCES

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DOI: 10.37200/IJPR/V24I4/PR201087
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020

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DOI: 10.37200/IJPR/V24I4/PR201087
Received: 22 Oct 2019 | Revised: 13 Sep 2019 | Accepted: 15 Jan 2020