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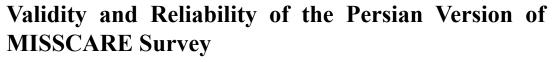## "Caspian J Health Res"

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Research Paper
Validity and Reliability of the Persian Version of MISSCARE Survey

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ABSTRACT

Background: The MISSCARE survey is a useful instrument measuring the amount and type of missed nursing care and its important reasons, developed by Kalisch and Williams in 2009 and revised in 2019.

Objectives: The present paper aimed to report the psychometric properties of part A (missed nursing care) and part B (reasons for missed nursing care) of the MISSCARE tool translated into Persian.

Materials & Methods: A Persian version of the MISSCARE tool were evaluated by a panel of experts, and the psychometric properties were determined with 326 nurses randomly selected from non-emergency wards of seven educational and medical centers in Rasht, North of Iran. Nurses completed the instruments from January to March 2021. Content validity was evaluated by calculating content validity index (CVI). Confirmatory factor analysis (CFA) was used to assess construct validity. Internal consistency (reliability) was measured using Cronbach's alpha coefficient.

Results: CVI was measured 0.82 and 0.79 for parts A and B of the survey. The fit indices of CFA indicated the acceptable fit for the measurement model of part B (missed nursing care reasons). Also, factor loadings of items on three factors of labor, material and communication confirmed the structural validity of part B of the survey. Cronbach's alpha coefficients for parts A and B were 0.991 and 0.994 in whole, and Cronbach's alpha coefficient for three factors of part B ranged from 0.831 to 0.936 confirmed their reliability.

Conclusion: The Persian version of the MISSCARE tool is valid and reliable for measuring missed nursing care and its reasons. It can be used by nursing authorities for evaluation purpose in Iranian hospitals.

Keywords: Validity, Reliability, Psychometrics, Nursing care, Iran

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1. Introduction

Missed nursing care is a relatively new concept and is considered as an error of omission [1]. It refers to any aspect of required care that is delayed or omitted either in part or in whole [2]. Kalisch first proposed missed nursing care concept in 2006 [3]. Her qualitative study indicated nine nursing activities that were regularly omitted including; hygiene and mouth care, fluid intake and output documentation, delayed or missed feedings, ambulation, turning, patient education, discharge planning, emotional support, and general nursing surveillance of the patients, and also seven relevant reasons of missed nursing care including too few staff, time required for the nursing intervention, poor use of existing staff resources, ineffective delegation, poor teamwork, habit and denial [3].

The MISSCARE survey was designed in 2009 by Kalisch and Williams to investigate nursing staff perceptions of delayed, undone or uncompleted nursing care and the perceived reasons for missing care [1]. The survey was developed for use in general medicine or surgery units of hospitals for adults [1, 2]. This scale had a minor revision in 2019 [4]. Also, a version of MISSCARE was developed for pediatric settings named MISSCARE-Ped [5], and an adaptation of the survey was presented to the Maternity Care Setting [6].

The MISSCARE scale consists of two sections (part A and B) that can be used independently. The scale is self-administered and completed by clinical nurses. The part A of the instrument contains 25 items of core nursing activities that are routinely omitted. The frequency of missed care in a specific ward chooses from a 5-point Likert-type answer as never missed [1] to always missed [5] for performing each nursing task either by the nurse or by other nurse staff. Part B contains 17 items in three dimensions (labor resources, material resources and communication) to measure why nursing care activities are omitted. These items had 4-point Likert-type answers from 1 to 4 as not a reason for missed nursing care [1] to significant reason [4]. The nurse should choose one option regarding how effective the mentioned reason was in missed nursing care in the previous work shift. These answers indicate the importance of the mentioned reason [1, 2].

The MISSCARE Survey has been translated into several languages, such as Icelandic [7], Turkish [8], Portuguese [9], Swedish [10], Czech and Slovakian [11], Persian [12] and Italian [13] and has been tested for reliability and validity.

Psychometric properties of the MISSCARE survey-Persian version showed the validity and reliability of the instrument [12]. In this study, the authors introduced different domains from original scale for Part A (including necessary care, secondary care, and supportive care), or for Part B (including communication, labor resources, material resources, responsibility, and unpredictable situations), which resulted in an acceptable fit on CFA. However, this study has some limitations. A convenience sample of nurses from limited units participated in the study, analyses were performed based on different domains from the original MISSCARE survey, and also, the last revision of the MISSCARE survey [4] was not considered; so, as the authors stated replication of the study in other settings with solve some limitations can improve the generalizability.

Missed nursing care is a common problem across hospitals in all countries. Research showed missed nursing care is related to the patient's satisfaction or outcomes [14]. National Institute for Care and Health Excellence (NICE) proposed that missed care could be a potentially helpful indicator of the quality of nursing services [15]. Awareness of health care managers and nurses on missed nursing activities or their reasons helps to understand the extent of the problem and costs and risks associated with missed care. It provides explicit guidance on identifying strategies to reduce its occurrence and improve quality. Since using valid and reliable instruments in the research are essential, the present study aimed to investigate the psychometric properties of the Persian version of the MISSCARE survey.

2. Materials and Methods

Translation

The initial Persian translation of the 'MISSCARE' tool was obtained from the Chegini et al. study, which had the permission of the original developer [16]. It included 24 items in part A and 17 items in part B from the original survey [1]. Then, regarding the most recent version of the tool [4] some revisions were made into the instrument: the item "Adequate surveillance of patients" was added to part A and the item "Ambulation three times per day or as ordered" was revised to "ambulation/mobilization three times per day or as ordered". Also, five items were added to part B, such as emotional or physical exhaustion, inadequate supervision of nursing assistants, interruptions/multitasking, lack of cues/reminders, and insufficient support from leadership [4].

As details stated in Chegini et al. study, the initial Persian version of the 'MISSCARE' survey was produced in a forward-backward method for translating the tool by two bilingual language experts [16]. In the present study, an independent Persian version of the survey was produced by an English translator expert and discussed in an expert panel of nurses separately. A pre-final Persian version of the tool was prepared with a comparison and combination of all three Persian questionnaires from our study and Chegini et al. study, with slight adjustments in wording.

A panel of experts, including nine people (three nursing faculty lecturers, two head nurses, and four clinical ward nurses from different hospitals of the study), reviewed the survey. Regarding the comments of the panel of experts, the item "feeding patient when the food is still warm" was revised as "surveillance on feeding patient when the food is still warm" because in Iran, nurses are not responsible for it. Also, the items "performing tasks outside responsibilities" and "Excessive and duplicate documentation" were added to part B. Totally, 25 and 24 items were assessed in parts A and B, respectively.

To evaluate the face validity of the translated survey, 15 nurses answered the questionnaire separately, and two of the authors reviewed their opinions about the questionnaire's wording, understandability, interpretation and cultural relevance. Finally, with minor revisions, the final Persian version of the survey was prepared.

Participants

Participants answering the survey were nurses working in the non-emergency departments of adult hospitals with at least 6-month of work experience. Nursing students who passed their internship or nurses unwilling to participate were excluded.

The minimum required sample size in the CFA is 7 to 10 per item [17], and the required sample size was estimated to be at least 240. A simple random sampling method was used to select nurses from the list of nurses working in each seven adult educational-medical centers in city of Rasht, proportional to the number of hospitals' beds.

Data collection

After preparing the final MISSCARE survey in the Persian language, approved by the panel of experts, an envelope including the survey was given to the participants. Also, a written explanation about the objectives of the study, respondents' anonymity and confidentiality of the information,

and the authority to participate in the survey was given to the nurses. Nurses completed the questionnaire during their break time, following receiving written informed consent. Data were collected from January to March 2021.

Statistical analysis

Acceptability of the instrument was assessed by the rate of the omitting items. The content validity index was calculated as the proportion of items that were rated as "relevant" or "very relevant" divided by the number of panel experts [18]. The structural validity was checked using Confirmatory factor analysis (CFA) with maximum likelihood estimation. The reliability of parts A and B of the survey were examined through internal consistency by reporting Cronbach's alpha coefficient and 95% confidence interval. A coefficient of more than 0.7 indicates good reliability. Statistical analyses were performed using Excel 2010, IBM SPSS and AMOS v.21 (IBM, Armonk, NY, USA) software.

3. Results

Most participants were female (95%, n=310). The Mean±SD age was 36.7±8.5 years old. Most of them had a bachelor's degree (90%, n=290) and 32 nurses (10%) had a master's degree. The Mean±SD duration of nursing work was 12.2±5.5 years, and worked on their current ward was 6.8±5.5 years. Most nurses worked in rotating shifts (68%, n=219) followed by working in internal care (66%), intensive care (19%), or surgical (14%) units.

Regarding the acceptability of the survey, the data showed that 72% of the participants completed the questionnaire without omitting any items, 15% had left only 1 item unanswered, 6% had not answered two items, and 7% had not answered more than two items. The highest non-response item was the item "Response to call light is initiated within 5 minutes", with 13% non-response, while in other cases, the non-response to each item was at the maximum of 5%.

The content validity index was obtained as 0.82 and 0.79 in parts A and B of the survey, respectively. Part A of the survey includes a list of independent nursing activities that are logically separated from each other and are subjected to one factor (the exploratory factor analysis approved it, but the details have not been explained), the structural validity of the Persian version of the questionnaire was examined only in part B. For part B (reasons for not performing or delaying the care), factors of human resources, material resources and communication were considered in CFA. The fit indices of the measurement model showed an acceptable to a good fit of the structure (Table 1).

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Table 1. Fit indices resulted from confirmatory factor analysis

Index	CFI	TLI	RMR	RMSEA (L-U Bound)	GFI	Chi/df
Favorable threshold	>0.90	>0.90	<0.05	<0.08	>0.90	<3.0
Estimated value	0.91	0.895	0.068	0.077 (0.070-0.084)	0.91	2.87

CFI, comparative fit index; TLI, Tucker-Lewis Index; RMR, root mean square residual; RMSEA, root mean square error of approximation; L-U bound, lower to upper bound

Table 2. Factor loadings of items in confirmatory factor analysis (Part B of the Persian version of MISSCARE questionnaire)

Item (Reason for Missed Nursing Care)	Factor		
	Labor	Material	Communicate
Unexpected rise in patient volume and/or acuity on unit	0.72		
Interruptions/Multitasking	0.70		
Inadequate number of assistive and/or clerical personnel	0.68		
Inadequate number of staff	0.67		
Heavy admission and discharge activity	0.64		
Emotional or physical exhaustion	0.59		
Urgent patient situations	0.55		
Supplies/equipment not available when needed		0.93	
Supplies/equipment not functioning properly when needed		0.88	
Medications were not available when needed		0.79	
Tension or communication breakdowns with the nursing team			0.82
Inadequate support from leadership			0.81
Nursing assistant did not communicate that care was not provided			0.79
Tension or communication breakdowns with the medical staff			0.78
Lack of back-up support from team members			0.78
Tension or communication breakdowns with ancillary/support departments			0.77
Caregiver off unit or unavailable			0.75
Inadequate supervision of nursing assistant			0.73
Other departments did not provide the care needed			0.71
Inadequate hand-off from previous shift or sending unit			0.70
Lack of cues/reminders			0.68
Performing tasks outside responsibilities*			0.66
Unbalanced patient assignments			0.55
Excessive and duplicate documentation*			0.47

*Item added by this study expert panel.

The factor loadings of each item on the three factors are listed in Table 2. Except for the item "excessive documentation and duplicate registration" with a factor load of 0.47, in all items, factor loadings were obtained from 0.55 to 0.93, which confirms the structural validity of part B of the instrument.

Cronbach's alpha coefficient was used to check the internal consistency of the questions in each part of A and B. Cronbach's alpha coefficient was 0.991 with a 95% confidence interval (CI) of 0.989 to 0.992 in part A. Cronbach's alpha coefficient for items in part B was 0.994 (95% CI: 0.934 to 0.952). The coefficient for each factor was obtained as 0.831 (95% CI: 0.801 to 0.858) for human resources, 0.895 (95% CI: 0.873 to 0.913) in material resources and 0.936 (95% CI: 0.925 to 0.946) for communications which confirm the reliability of the survey.

4. Discussion

This study investigated the psychometric properties of the Persian version of the MISSCARE survey. A large number of nurses from small to medium general hospi-

tals completed the Persian version of the MISSCARE questionnaire. In the psychometric evaluation of the questionnaire, relatively few unanswered questions were observed in completing of the questionnaire, stating the tool's acceptability. CVI confirmed the clarity and relevance of the Persian version of the questionnaire. CFA results on Part B of the scale showed acceptable fit on the measurement model and confirmed all items of missed nursing care under the three factors of labor, material and communication. Also, Cronbach's alpha coefficients were higher than 0.8, indicating good reliability and confirming the internal consistency of the items in parts A and B.

Results of psychometric testing of the MISSCARE survey in different languages are shown in Table 3. Regarding the acceptability of the survey, the present paper results showed that responding to the items with no missing was lower than the US participants but was similar to the Icelandic [7] or Portuguese [9] versions and confirmed its ease of use.

Table 3. Results of psychometric testing of MISSCARE in different languages

Country/ Language	No. of Participants	CVI / Structural Validity by CFA for Part B	Acceptability	Cronbach's Alpha Coefficient				Test-ReTest Correlation
				Part A	Part B			
					Labor	Material	Communication	
U.S./English (original)	459	0.89/ good	85%	--	0.69	0.71	0.85	r(A)=0.87, r(B)=0.86
U.S./English (revision)	145	--	(A) 90%, (B) 93%	0.94	0.90 for the whole Part B			r=0.95
Turkey/ Turkish	436	0.85/--	100%	0.936	0.765	0.688	0.911	r(A)=0.95, r(B)=0.667
Brazil/ Portuguese	71		70%	0.964	0.785	0.797	0.906	---
Iceland/Icelandic	599	--/ good	70%	--	0.798	0.795	0.825	r(A)=0.782, r(B)=0.530
Italia/Italian	979	--	79%	0.94	0.70	0.81	0.90	--
Iran/Persian (Chegini et al. study)	46	--	--	0.81	0.86 for the whole Part B			r=0.71 to 0.79
Iran/Persian (Hosseini et al. study)	300	0.994(A), 0.969(B)/different domains was used in CFA.	--	0.933	0.910 for the whole Part B			--
Iran/ Persian (Present Study)	326	0.82/acceptable	72%	0.991	0.831	0.895	0.936	--

CVI indicated content validity index; CFA, confirmatory factor analysis

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The CVI of the survey was similarly good in Persian and other different languages, stating the whole validity of the instrument is good. But, the construct validity of part B of the instrument showed an acceptable measurement model by CFA for the Persian tool compared with a good fit of the instrument in other languages [1, 7]. In some studies, the different domains were considered for part A or B of the instrument [9, 11, 12], which caused an acceptable to a good fit of the measurement model. Also, despite of items "Urgent patient situations" and "Heavy admission and discharge activity" loaded weakly on factors in the Dabney et al. study [4], these items showed a good loading on labor factor in our research, likewise the Icelandic version study [7]. The reason may be the survey result on a larger population in our study compared with the Dabney et al. study.

In the present study, Cronbach's alpha coefficients obtained for parts A and B were higher than 0.8, indicating a good internal consistency of the scale. Cronbach's alpha coefficients of the present study, likewise another study on the Persian version of the MISSCARE survey in Iran [12], were obtained higher than other research in different languages (Table 3). These results may be related to some extra items in our research instrument and more homogeneity of our nurses in Iran. Most of our participants had bachelor's degrees, or some had master's degrees in nursing. In contrast, participants in other studies included assistant nurses, technicians, and nurses with different degrees or responsibilities that may increase errors.

The Persian version of the survey in the present study contains two extra items of missed nursing care reasons compared to the original survey [1] or its revision [4]. In this regard, the item "performing tasks outside responsibilities" with a factor loading of 0.66 reveal a consistent loading under the communication factor. But as the loading factor of the item "excessive documentation and duplicate registration" was 0.47, it seems that excessive documentation may not be a well-defined concept, and this item needs to revise or can be removed.

5. Conclusions

Along with the authors emphasized the importance of conducting studies to develop a culture adoption scale regarding nursing care in the Iranian context, the Persian version of the MISSCARE instrument, along with a minor revision, is a valid and reliable instrument for measuring missed nursing care and its reasons among Persian language nurses in adult medical centers of Iran.

In addition to the general limitation of self-reporting and lack of direct observation data, the present study suffered from some more limitations. Test–retest reliability as temporal consistency, discriminate validity and convergence between the Persian version of the survey and other related instruments were not examined. For future studies, assessing the concurrent validity of the instrument through scale correlation with other related instruments, such as the Persian version of the CDI-25 [19] questionnaire is suggested.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Review Board of the research deputy and the Ethics committee of Guilan University of Medical Sciences (Code: IR.GUMS. REC.1399.325).

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