

The Psychometric Properties of the Persian of Miss Nursing Care Tool among Iranian Nurses

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Abstract

Background: Miss nursing care, as an important hidden problem, can disrupt nursing function. Hence, it has been identified as a quality index for nursing care and patient safety recently. Therefore, amounts and types of miss nursing care as well as its reasons have to be explored using a quantitative tool. The present study aimed to investigate the features of the localized miss nursing care tool in 2020.

Methods: In this methodological study, miss nursing care tool was translated and back-translated and its face and content validity was assessed by a panel of experts. Then, the tool was distributed electronically among 300 nurses with various experiences working in healthcare centers. The construct validity was evaluated via exploratory factor analysis. Its reliability was also explored using Cronbach's alpha and Intra-class Correlation Coefficient (ICC).

Results: This study was conducted on 300 nurses. The exploratory factor analysis, which resulted in the identification of three factors in the second part of the tool, namely relations, financial resources, and human resources, explaining 79.6% of the total variance. The reliability of the first and second parts of the tool was 0.912 and 0.901, respectively. Additionally, the ICC was found to be 0.687 for the first part and 0.706 for the second part of the tool.

Conclusion: The Persian version of the miss care tool benefitted from appropriate validity and reliability. Thus, it could be used as an index for evaluation of clinical nursing care.

Introduction

The concept of miss care encompasses all aspects of clinical, emotional, and prescriptive nursing, which have been completed to some extent, have been delayed, or have not been completed at all (1). Miss care has been also known as implicitly rationed care; nursing care left undone, unmet patient needs, unfinished nursing care, and delayed nursing care (2). Miss nursing care, as an important hidden problem, could result in nursing dysfunction (3, 4). It could also lead to undesirable outcomes, such as morbidity, mortality, patients' dissatisfaction with healthcare providers (5), and increased financial burden on the healthcare system, because it could result in readmission and increase the length of hospital stay for management of complications and negative outcomes (6). Therefore, it has been identified as a quality index for nursing care, patient safety, and patient satisfaction recently (4, 7). A review study indicated that 55–98% of the nurses had not done or completed at least one care activity during their last work shifts (8). In developed countries, it has been estimated that one in every 10 hospitalized patients is hurt due to the received or neglected care (9). Considering the prevalence of these mistakes in Iran, the situation does not seem to be more desirable compared to Western countries. This has been confirmed by the increase in the number of referred files and people's complaints from physicians and nurses to the Medical Council and courts of law (10).

The conceptual framework of the present study was the miss care model presented by Kalisch (2006), which consists of three elements: 1- structure (hospital, ward, and nursing personnel's characteristics), 2-

process (miss nursing care), and 3- outcome (staff's outcomes including job satisfaction and patients' outcomes including falling and prevalence of pressure ulcers) (11). This framework represents the interaction between miss nursing care and staff's and patients' outcomes and such variables as hospital features (educational vs. non-educational), ward (internal, surgical, intensive care unit, etc.), and staff (sex, age, position, number of work hours per week, work hours, job tenure, extra work hours, staff adequacy, and number of patients cared for during the last shift) (12). In fact, this model has been designed based on three antecedents; i.e., financial resources, human resources, and relations, which enable nurses to carry out the care process. These three antecedents are under the influence of the nurses' internal processes; i.e., team norms, decision-making priorities, habits, and values (13). Miss care standard tool was designed by Kalisch in 2006 in order to determine the cares that are omitted or delayed and to assess the barriers against care provision using 25 focus groups with nurses and nursing assistants (14). The tool was validated for adult patients hospitalized in internal, surgical, and intensive care units. The miss care tool was used in various centers later and was even localized in some countries. For instance, Terzioglu assessed the acceptance, reliability, and validity of the Turkish version of the tool in 2012 and compared the hospitals in Turkey and the U.S. regarding the types and causes of miss nursing care. The results indicated the appropriate reliability and validity of the designed tool (15). Zelenikova also performed a cross-sectional study in order to localize the miss care tool in Czech Republic and Slovakia. The internal consistency of the first section of the tool was approved by Cronbach's alpha coefficient of 0.939 for the Czech version and 0.945 for the Slovakian version (4). This tool has also been used for development of similar tools for other groups of patients. It was used by Tubbs-Cookey for development of miss care tool in neonatal intensive care units (16) and Bagnasco for preparation and validation of the tool for pediatrics in the U.S. in 2018 (13). Simpson also modified and validated the tool to be used in prenatal care units in the U.S. in 2019 (17).

The aforementioned studied demonstrated that the rates of miss nursing care could be different in various hospital wards as well as in different communities. Besides, in order to achieve a true picture of miss nursing care, a reliable and valid tool is required. Up to now, no valid and reliable Persian tool has been designed in this field. Considering the fact that the miss care tool is globally accepted, developing a tool based on this tool can be a good choice for evaluation of miss nursing care among adult patients. Therefore, the present study aims to explore the psychometric properties of the Persian version of the miss care tool in order to evaluate nursing care.

Materials And Methods

Study design

This methodological study aimed to investigate the reliability and validity of the Persian version of the miss care tool.

Tool

The standard miss care tool consists of three sections with 41 items. The first section contains demographic and underlying information, including work conditions and satisfaction level. Part A (24 items) involves a series of nursing activities for assessment of miss care elements. In addition, part B (17 items) investigates the reasons for miss care in three dimensions, namely relations/teamwork (nine items), financial resources (three items), and human resources (five items).

In this study, the participants were requested to choose the answer with the best level of agreement with the item. For the first part, the respondents were asked to mark always, rarely, sometimes, often, or never for the miss care by all personnel in their wards. For the second part, they were required to choose very important reason, moderate reason, weak reason, or no reason. Higher scores represented higher levels of miss nursing care in part A and a stronger reason for its occurrence in part B.

Procedure

Translation

In order to translate the miss care tool, the guidelines proposed by the World Health Organization (WHO) were used. Considering the defined standard in tool localization, at first, permission was gained from Dr. Kalisch, the designer of the tool in the University of Michigan. Then, the tool was translated to Persian by two proficient translators separately. The two translations were discussed in a specialized panel and the two translators' opinions were matched. The approved Persian version was then given to a specialist in Persian Literature who was required to edit it with respect to grammar and wording. Afterwards, the Persian version was back-translated into English by a proficient translator. Finally, the translated version was sent to the designer and the items were reviewed and confirmed accordingly.

Content and face validity

Cognitive interview

The face validity was assessed via face-to-face interviews with 10 nurses with various clinical experiences and job tenures. These nurses were requested to evaluate the items with regard to ambiguity, difficulty, and appropriateness and suggest terms for substitution, if necessary.

Content validity

Content Validity Index (CVI) was explored using Waltz and Bussel's index. In order to determine CVI, 'cultural relevancy was used for all items based on a four-point Likert scale. In doing so, 15 nursing specialists were asked electronically or in person to determine the relationships between the tool items

with regard to the subscales using a four-point Likert scale (1: not related, 2: somehow related, 3: related but needs revision, and 4: completely related). Then, CVI was calculated for the items that received the highest scores (rating of 3 or 4) using the following formula. It should be noted that the value of 0.79 was considered as acceptable (18). The scale-CVI was computed, as well.

$$CVI = \frac{\text{Number of raters giving a rating of 3 or 4}}{\text{Total number of raters}}$$

Construct validity

The present study participants included the nurses with at least six months of work experience who cared for adult patients in different wards. The participants were selected through convenience sampling. In order to determine the construct validity of the tool and discover the hidden factors, use was made of Exploratory Factor Analysis (EFA), which is the most common method for classification of items. Tebachnick and Fidel stated that a sample size of at least 300 participants was required for factor analysis (19). In the present study also, 300 tool s were completed by nurses in 10 healthcare centers.

Reliability

The reliability of the tool was assessed by internal consistency and test-retest methods. Internal consistency was determined using Cronbach's alpha coefficient and temporal consistency using the test-retest method. For this purpose, the tool was completed by 30 nurses with a two-week interval.

Job satisfaction

The first part of the tool contained three items related to job satisfaction: satisfaction with the job, satisfaction with teamwork in the ward, and satisfaction with the job position. The respondents were asked to evaluate the items using a five-point Likert scale (5: very dissatisfied, 4: dissatisfied, 3: not satisfied and not dissatisfied, 2: satisfied, and 1: very satisfied).

Ethical considerations

The necessary permissions were obtained from the designer of the tool and the authorities of the healthcare centers. Moreover, the nature and objectives of the research were completely explained to the participants. They were also informed about the voluntary nature of the study. Confidentiality of the data was also taken into consideration and the results were published anonymously. All methods were performed in accordance with the relevant guidelines and regulations.

Data analysis

All data analyses were carried out using the SPSS statistical software, version 25. Descriptive statistics included mean, Standard Deviation (SD), and absolute and relative frequencies. In order to determine the psychometric properties of the tool, factor analysis, Kaiser-Meyer-Olkin (KMO) test, and Bartlett's test of sampling adequacy were used (Table1). At first, EFA using maximum likelihood was used to analyze the related items. It should be noted that the normal distribution of data was the prerequisite for this method. In addition, skewness and kurtosis of the variables was within the range of ± 3 . Then, maximum likelihood with PROMAX rotation was used to promote the initial factor structure. The minimum cut point for the factor load was considered >0.3 .

Table 1
Final results of KMO and Bartlett's test of sphericity to determine the validity of the tool

Bartlett test			
KMO	Chi-Square	df	p-value
.906	2160.809	136	P= .000

Results

Psychometric investigations of the Persian version of the miss care tool

This study was conducted on 300 nurses taking care of adult patients in different hospital wards (except for pediatric wards) (Table 2). After forward-backward translation, based on the results of the investigation of face validity, the understandable version of the tool that was appropriated to the Iranian culture was selected.

Table 2
The characteristics of participants (N:300)

Variable		n	%
Age(years)	20–30	120	39/6
	40 – 30	123	40/6
	50 – 40	52	17/2
	>50 years	5	1/7
Gender	Male	245	80/9
	Female	55	18/2
Professional experience	less than 1 years	16	3/5
	1 to 2 years	31	10/2
	2 to 5 years	63	20/8
	5 to 10 years	86	28/4
	more than 10 years	102	33/7
experience on current unit	less than 1 years	30	9/9
	1 to 2 years	54	17/8
	2 to 5 years	77	25/4
	5 to 10 years	72	23/8
	more than 10 years	64	21/1
Work hours	morning	57	18/8
	evenings	7	2/3
	evening and night	45	14/9
	rotating shifts	190	62/7
adequacy of staffing	100% of the time	11	3/6
	75% of the time	38	5/12
	50% of the time	83	27/4
	25% of the time	95	31/4
	never	73	24/1

The CVI was found to be > 0.79 for all items in the first part of the tool. Besides, Ave/scale-CVI was 0.9 in the first part. The mean CVI for all 41 items was equal to 0.86.

Construct validity

Prior to the calculation of construct validity, a pilot study was conducted on 70 nurses working in various healthcare centers. According to the results, the reliability coefficient of the first and second parts of the tool were 0.94 and 0.92, respectively. Considering the acceptable results at this stage, the tool was entered into the next step. The results indicated that the three factors explained 79.6% of the variance.

Since part A included the independent nursing care tool, factor analysis was only conducted for the second part. Extraction of factors using the maximum likelihood analysis with Eigenvalue > 1 led to the identification of three factors, which explained 79.6% of the total variance. The matrix of the rotated factors has been presented in Table 3. This matrix revealed the dimensions to which the items belonged. Overall, the final tool included 41 items and three factors in two sections. After the factor analysis and achievement of the dimensions, Cronbach's alpha was computed again.

Table 3

Exploratory factor loadings of items in Missed Nursing Care in Iran with three factors and Cronbach's Alpha

Cronbach's Alpha	Eigen Value	Variance	Items	Factor Loading			Item
				1	2	3	
6/81	33/5	4/29	Tension or communication breakdowns with the medical staf			.866	Communication
			Nursing assistant did not communicate that care was not provided			.748	
			Tension or communication breakdowns within the nursing team			.716	
			Caregiver off unit or unavailable.			.552	
			Tension or communication breakdowns with other ancillary/support departments			.413	
			Heavy admission and discharge activity			.383	
			Lack of backup support from team members			.507	
			Other departments did not provide the care needed			.393	
			Inadequate hand-off from previous shift			.463	
2/79	08/5	1/29	Supplies/ equipment not available when needed		.803		Material Resources
			Supplies/ equipment not functioning properly		.776		
			Medications were not available when needed		.426		
7/80	6/3	1/21	Unexpected rise in patient volume and/or acuity on the unit	.756			Labor resources

Inadequate number of staff	.721
Inadequate number of assistive and/or clerical personnel	.597
Urgent patient situations	.537
Unbalanced patient assignments	.387

Reliability

The Cronbach's alpha coefficient was calculated as 0.912 for the first section and as 0.901 for the second one. Cronbach's alpha coefficients for all subscales have been presented in Table 3. Additionally, ICC computed through the test-retest method was found to be 0.687 for the first section and 0.706 for the second one (Table 4).

Table 4

Correlation between test scores and retesting the final form of Missed Nursing Care tool and the Reasons affecting it (N:30).

P Value	ICC** (CI 95/0)	second time	first time	Variable
		mean ± SD		
001/0	687/0 (839/439-0/0)	07/17 ± 66/93	07/19 ± 00/91	Score of Elements of Missed Nursing Care
001/0	706/0 (849/469-0/0)	81/7 ± 36/29	54/7 ± 76/29	Score of Reasons for Missed Nursing Care

Elements of miss care

Out of the 24 nursing activity elements in the first section of the tool tool, five were responsible for the highest percentage of miss nursing care. These five elements were assisting a patient to walk, position change, emotional support, oral care, prescription of medications in 30 minutes, and documentation of essential information.

Reasons for miss care

Among relations, financial resources, and human resources, relations and teamwork were the main reasons for miss care in both males and females.

Discussion

Miss nursing care might occur during patient examination (44%), therapeutic interventions and basic care (73%), and discharge (71%), which could affect patients' safety and satisfaction with the received care (20). Although comparison of different countries can provide great insights regarding nursing care provision methods and their outcomes for patients, lack of a reliable measurement tool appropriated to language and culture is a major obstacle for investigation of nursing care quality (15). In this context, miss care is a component of the nursing process, which has been identified as a quality index for nursing care and patient safety recently (7).

The miss care tool was developed for collection of information in healthcare centers in the U.S. (21). In the present study, this tool was translated to Persian and its psychometric properties were assessed. The results demonstrated that this tool was a reliable and valid tool for evaluation of miss nursing care among adults in various therapeutic wards in Iran. The Cronbach's alpha coefficient of the first and second parts of the localized tool were 91.2 and 90.1, respectively, which confirmed the reliability and internal consistency of the tool. Similar results were also obtained in the studies conducted on the American (Kalisch), Czech and Slovakian (Zelenikova), Brazilian (Siqueira), Turkish (Terzioglu), Italian (Sist), and Icelandic (Bragadottir) versions of the tool. In the second section of the tool (reasons for miss care), construct validity using Cronbach's alpha coefficient revealed three factors, namely human resources, financial resources, and relations. The Cronbach's alpha coefficients ranged from 79.2 to 81.6, which indicated the internal consistency of the tool.

In the current study, the most common miss cares included assisting a patient to walk, changing the patient's position every two hours, oral care, bathing the patient, and training the patient. In the same vein, Zelenikova (2019) reported that the mostly ignored nursing activities were assisting a patient to walk, position change, emotional support, oral care, prescription of medications in 30 minutes, and documentation of essential information. It was also stated that in case the nurses could not provide patients with the necessary services, they had to prioritize them (4). Dehghan Nayeri (2018) also disclosed that due to managerial and system requirements, Iranian nurses had to prioritize their care activities (22).

In the present study, relations were the most important reason for the incidence of miss care. In fact, nurses believed that this dimension was faced with greater challenges. Since teamwork is an important component of care provision environments and is accompanied with positive results for both staff and patients (7), strategies are required to improve teamwork and relationships in order to minimize the probability of miss nursing care. On the other hand, the current study findings showed moderate satisfaction with the occupation, teamwork, and position, indicating an overall job satisfaction. These

results were in agreement with those of the research by Morshedi (2020), which demonstrated that 77% of the nurses were satisfied with their status compared to the past (23).

Overall, the results of the present study as well as those of other investigations on miss care have revealed that this concept is a global phenomenon that can affect patient safety and the quality of nursing care. The miss care tool has been widely used for evaluation of this concept around the world (4). This tool can be used as an exploratory tool for miss nursing care resulting from active errors, such as carelessness, distraction, not following the norms, mistakes, and ignorance, or hidden factors, such as high workload, unspecified duties, inadequate supervision, deficient relationships, outdated resources, inappropriate care for facilities, reduction of standard processes, lack of professional training, and lack of technology (24).

Limitations

Considering the prevalence of COVID-19 disease, the researcher was not able to be present in healthcare centers and the tool s were electronically completed by the nurses in various health centers (educational, non-educational, private, or public). Hence, the nurses might have underestimated the rate of miss care. Furthermore, the nurses could not be observed during care provision in order to explore the neglected activities.

Conclusion

The present study results indicated that the Persian version of the miss nursing care tool with 41 items benefitted from appropriate reliability and validity and could be used to evaluate the miss care during hospitalization among adult patients. Nonetheless, miss care might not necessarily represent the low quality of nursing care; rather, it may result from a nurse's clinical judgement and prioritization of services based on patients' conditions. Further studies may be conducted on the time and causes of miss care and the resultant outcomes (13).

Clinical applications

By identification of the factors leading to negligence of care, nursing managers can take measures for empowerment of human and financial resources and elimination of imbalance between the staff and the workload, so that standard care appropriated to patients' needs can be provided continuously.

Declarations

Acknowledgement

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Conflict of interests

None declared.

Author's contributions

E.A was the study supervisor and contributed to all aspect of the study. R.Sh and L.S collected data. R.Sh was the main investigator and provided the first draft. KH.Hr was the study advisor and contributed to the study design, critically reviewed the paper and provided the final draft. L.S was the study advisor and contributed to the writing process, and the statistical advisor and contributed to data analysis. All authors read and approved of the final manuscript.

Ethical approval

The University Of Social Welfare and Rehabilitation Sciences Ethics Committee approved the study. All participants signed informed consent form.

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Availability of data and materials:

All available data can be obtained by contacting the corresponding author. All data requests should be submitted to the corresponding author for consideration. Access to anonymized data may be granted following a review.

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