Translation and psychometric properties of the MISSCARE survey-Persian version

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Abstract

Background: Providing safe and high-quality nursing care is an essential task of nursing. Nurses may be unable to provide patients with all of the necessary care for numerous reasons, such as an increase in the number of patients and a low number of nursing staff. Moreover, they may have to omit, postpone, or incompletely perform a series of care, referred to as missed nursing care. The purpose of this study was to translate and conduct psychometric testing of the MISSCARE Survey.

Method: In this study, we accurately translated the MISSCARE Survey. Its acceptability, construct validity, and internal consistency were analyzed. This cross-sectional study was conducted in the summer of 2020 in educational hospitals in Ardabil, Iran. The participants were 300 nurses who worked in educational hospitals and were randomly selected.

Results: Participants in this study included 300 nurses from five units, including general medicine (13.3%), COVID-19 (45.0%), surgery (18.7%), critical care unit (6.3%), and intensive care unit (16.7%), who worked various shifts, of whom 84.7% were female. The total content validity in Part A was 0.944, and that in Part B was 0.969. Part A was divided into three domains (necessary care, secondary care, and supportive care), and Part B was divided into five domains (communication, labor resources, material resources, responsibility, and unpredictable situations). In both parts, the chi-square index was < 3, and the RMSEA index was < 0.08. The internal consistency measured by Cronbach’s alpha was 0.933 for Part A and 0.910 for Part B for the Persian version of the MISSCARE Survey.

Conclusion: Based on the outcomes of this research, it can be concluded that the Persian version of the MISSCARE Survey is valid for use in Iranian hospitals and can be used to identify missed care and the reasons behind it. Nursing managers can also use it to improve the situation and provide the highest-quality care.

Keywords: Nursing, Patients, Missed care, Translation, Psychometrics

Background

Nursing care is a skillful, safe, high-quality, ethical, and shared-care process designed and planned based on the best clinical evidence supporting the patient’s health, symptom relief, or a quiet death [1]. Ensuring patient health and the quality of nursing care are fundamental challenges for nursing managers [2]. Many studies have shown a relationship between the performance of nursing staff and the quality of patients’ health [3, 4]. On the other hand, the hospital work environment involves rapid and unpredictable events that can lead to disruptions and mistakes in nursing care because nurses constantly move from one activity to another and manage multiple sources of care [5]. Sometimes, nurses cannot address all care requests or may not complete all aspects of care for various reasons. In such situations, nurses may reduce, delay, or eliminate care. These cases are more pronounced, particularly in the current circumstances and the COVID-19 epidemic era, and with the...
increase in the volume of patients and the increase in
the workload, less care may be provided.

Missed nursing care refers to any aspect of care that is
partially or completely eliminated or delayed [6]. Kalisch
first identified the phenomenon of missed nursing care
in a qualitative study [2]. Nurses are trained in standards
of care in basic nursing education programs, and this
learning is reinforced through on-the-job training and
assessment systems. However, nurses reported that some
aspects of nursing care were missed regularly. The find-
ings of this study point to two critical issues in nursing:
the patient care provided is less than what nurses have
learned and less than what patients need to recover [7].
Further, when nurses are unable to fulfill their responsi-
bilities to meet the patient’s needs, they feel dissatisfied
with themselves and their work.

According to Bowles and Candel, nurses who have
negative perceptions of their work experience may leave
their jobs at the earliest opportunity, which exacerbates
the lack of organizational resources and the use of re-
sources for employment and acquaintance for replace-
ment [8]. Therefore, it is necessary to use a tool that can
examine the extent and nature of this phenomenon and
make it possible for employers to study the percentage
of eliminated care in addition to the reasons for such
negligence. For this purpose, the MISSCARE Survey was
developed to measure missed nursing care and the rea-
sons behind it. The tool was developed in the United
States and has two parts: Part A, which contains 24 ele-
ments related to primary nursing care categorized as
“educating the patient about disease, procedures, and
diagnostic studies,” and Part B, which contains 17 rea-
sons for missed care categorized as an “inappropriate ra-
tio of patients to nurses” [2]. The MISSCARE Survey has
been evaluated in many countries, such as Brazil,
Slovakia, Sweden, and Turkey, and was deemed accept-
able in all of those countries [9–13]. Previous studies
have shown that ambulation, turning, delayed or missed
feedings, and emotional support were missed more fre-
quently than other types of care [9–13]. According to
the literature, although it is essential to have a tool for
measuring missed nursing care, a study to validate the
MISSCARE Survey has not been conducted in Iran.
Thus, the purpose of this study was to translate and con-
duct psychometric testing of the MISSCARE Survey.

Method

Design
The design of the study was a cross-sectional, descriptive
survey.

Characteristics of the MISSCARE survey
Kalisch et al. developed the MISSCARE Survey in 2009
in the United States. It consists of three parts: the first
part includes demographic information; the second part
(Part A) includes 24 items, a list of nursing care activ-
ities, which are answered on a 5-point Likert scale ran-
going from “always missed” to “never missed.” The third
part (Part B) includes 17 items regarding the reasons for
missed care, which are answered on a 4-point Likert
scale ranging from “significant reason” to “NOT a reason
for missed nursing care.”

Procedure

Translation of the MISSCARE survey
First, we obtained official approval from the author to
use the MISSCARE Survey. The translation of the MISS-
CARE Survey was accomplished according to World
Health Organization (WHO) guidelines, including trans-
lation, the use of an expert panel, back-translation, cog-
nitive interviewing, and a finalization process.

In the first step, we translated the survey with two in-
dependent expert translators; then, in a group that in-
cluded two nursing faculty members and the authors, we
combined the two versions of the translation into a sin-
gle version. Next, we translated that version back into
English with a native English translator who was fluent
in Persian. We then compared the translated English
and original versions with two other independent trans-
lators. A panel of five experienced nurses evaluated the
relevance and applicability of the translated versions and
created the final version of the MISSCARE Survey-
Persian.

Translating an instrument into another language and
culturally adapting it to a new context is time-
consuming and requires great effort from both the re-
searchers and the healthcare professionals. Therefore,
we sought help from some other researchers who were
experts in both languages and had the same experience.

The MISSCARE Survey-Persian version was given to
ten professionals and nursing experts for evaluation of
its content and face validity. We used the content valid-
ity ratio (CVR) and content validity index (CVI) to
evaluate content validity. To determine the CVR, we
asked experts to read each item and choose one of the
following options: “Essential and useful,” “Useful but not
essential,” or “Not essential.” The items selected as “Es-
sential and useful” were used to calculate and compare
the survey to the Lawshe table [14]. In this study, we
had ten experts. Thus, the minimum CVR for each item
was 0.62. The CVR for all items in Parts A and B of the
survey was greater than 0.62.

To determine the CVI, we asked experts to select “Fully related,” “Related,” “Somewhat related,” or “Irrele-
vant” for each item. The items selected as “Fully related”
and “Related” were used in the study. The minimum ne-
necessary score for each item was 0.79 [15]. In this study,
the CVI for Part A was 0.944, and that for Part B was 0.969, much higher than the minimum necessary score.

Face validity was calculated after determining impact score of each question. Items with an impact score of more than 1.5 are considered valid [16]. The face validity for all items in both parts of the survey was more than 1.5. Thus, the survey is considered valid.

**Participants**

Using the consensus sampling method, we chose 300 nurses from five units (general medicine, surgery, intensive care unit (ICU), cardiac care unit (CCU), and COVID-19) in four educational hospitals. Participants had at least a bachelor’s degree in nursing and at least six months of experience in nursing with no mental problems, and the response rate was approximately 60%.

**Data collection**

The MISSCARE Survey- Persian version was used for data collection, which began in February 2019. However, we had to halt collection in late February because of the COVID-19 pandemic. Collection was resumed in June 2020 and completed in September 2020.

**Data analysis**

We used Excel 2013 to evaluate content and face validity. Construct validity was assessed using confirmatory factor analysis (CFA) with maximum likelihood estimation using AMOS v. 21. Cronbach’s alpha and McDonald’s omega coefficient were used to assess the reliability of the survey. IBM SPSS version 21 and the “omega” function of the “psych” package in R (4.0.2) software were used for statistical analysis and \( p < 0.05 \) was considered statistically significant.

**Results**

The participants were 300 nurses from five units: COVID-19 (45%), surgery (18.7%), ICU (16.7%), CCU (6.3%), and general medicine (13.3%). Most of the participants (84.7%) were women; most (49.3%) were 25–44 years old, while 39.7% were 35–44 years old. The majority of the participants (97.3%) had at least a bachelor’s degree in nursing, and 99.3% worked as staff nurses. In this study, 44.4% of the participants had more than five years of work experience, while 55.6% had less than five years of work experience.

**Confirmatory factor analysis**

We divided the survey into different domains. Part A included necessary care, secondary care, and supportive care. Part B included communication, material resources, labor resources, responsibility, and unpredictable situations.

The result of construct validity testing via CFA in both parts A and B of the survey showed that the scaled chi-square with a degree of freedom was less than 3 and the RMSEA was less than 0.08 (Table 1). Therefore, the resulting model was confirmed (Figs. 1 and 2).

Tables 2 and 3 present the analysis of the two parts of the survey. The results showed that the relationship between all items and their structure or factors was significant, and all items had the necessary structural validity. In addition, all structures showed a significant correlation, which indicates a logical relationship between the structures in the building of the survey (Parts A and B). Finally, the construct validity of the survey was confirmed for both Parts A and B.

**Internal consistency**

Cronbach’s alpha and McDonald’s omega coefficients were used to determine the reliability of the survey. The results showed that all three factors of Part A and all five factors of Part B had good reliability. In addition, for both parts, the entire survey had a reliability rate of more than 0.7, indicating that both parts had good reliability and accuracy (Table 4).

**Discussion**

In this study, we translated the MISSCARE Survey and then assessed its internal reliability and construct validity to create a valid Persian version of the survey.

When we began our assessment of content validity, some of the experts in our study believed that some items in Part A were not useful in Iran. However, we retained those items, and after assessing nurses’ responses to them as well as the construct validity, we decided to keep the items in the survey. Thus, no items from either part of the survey were removed. In the translation of the MISSCARE Survey- Swedish version, the authors encountered numerous difficulties with certain items because 15 years had passed since the creation of the original survey; they thus removed six items from Part B [10]. Finding a term that describes “MISSCARE” was difficult in the Icelandic language, and the researchers working on the Icelandic version also had trouble explaining how participants should answer the items [13]. We encountered this problem as well; in some cases, we received a returned questionnaire and found that the participants answered the items in a manner that was the opposite of what was expected.

We divided both parts of the survey into different factors for construct validity. The Persian version of the MISSCARE Survey has three factors in Part A and five factors in Part B. Studies have been conducted in the US, Turkey, and Part A does not have any factors; rather, it is simply a list of nursing care activities [2, 10–13]. Zelenikova et al. divided Part A into four factors...
|                     | Chi-Square | df | Chi-Sq./df | P-value | GFI  | GFI  | CFI  | NFI  | RMSEA |
|---------------------|------------|----|------------|---------|------|------|------|------|-------|
| Missed care         | 593.57     | 245| 2.419      | 0.364   | 0.934| 0.908| 0.900| 0.906| 0.069 |
| Reason for Missed care | 285.998   | 108| 2.648      | 0.260   | 0.959| 0.907| 0.934| 0.900| 0.074 |

Fig. 1 Coefficients Standardized (Part A)
(assessment, individual needs, basic care, and planning) that could better assess the extent of missed nursing care [9]. Most of the studies divided Part B into three factors: labor resources, material resources, and communication. We divided Part B into five factors (labor resources, material resources, communication, responsibility, and unpredictable situations) to more accurately determine the reasons for missed care. In addition, the MISSCARE- BRASIL has five factors for Part B (labor resources, material resources, communication, ethics, and management) [12].

Both parts of the MISSCARE Survey- Persian version has good internal consistency, and Cronbach's alpha was 0.933 for Part A and 0.910 for Part B. The minimum required was 0.7. Cronbach's alpha for Part A in our study was higher than that in some former studies, such as the United States, Slovakia, and Iceland [2, 9, 13], but it was smaller than that obtained in Turkey's study [11]. For Part B, it was higher than that in studies such as those in the United States, Turkey, Sweden, and Iceland [2, 10, 11, 13] but smaller than that reported in the Slovakia study [9].

In Iran, the lowest degree in nursing is a bachelor's degree. Thus, most of our participants had bachelor's degrees, and some had master's degrees in nursing. In studies conducted in the United States, Slovakia, and Brazil, most participants were technicians and had an education level below a bachelor's degree [2, 9, 12].

Based on our results, each nurse cares for 1–4 patients in closed units (ICU and CCU) and 6–12 patients in other units. Kalisch et al. and Siqueira et al. stated that in their studies, each nurse cared for 1–2 patients in
closed units and 5–8 to patients in the surgical unit \[2, 12\]. There is a nursing shortage in Iran, and nurses there have to care for several patients during each shift. Missed nursing care may increase in a critical situation such as the COVID-19 pandemic; our results regarding the COVID-19 unit showed that supportive care was missed more often in that unit than in other units.

Additionally, the perception of staffing adequacy is positively associated with job satisfaction \[17\]. In our study, nurses’ satisfaction was assessed in three domains (current position, being a nurse, and teamwork). Our results showed that only 14.6% of nurses were very satisfied or satisfied in their current position, while 25.3% were very satisfied or satisfied with being a nurse, and 30.7% were very satisfied or satisfied with the teamwork in their unit. The level of satisfaction in all three domains was reported to be high in Siqueira et al.’s study, in contrast to the missed-care results in this study \[12\]. In the Slovakia study, researchers reported a low level of satisfaction in all domains \[9\]. In all studies, the level of satisfaction with teamwork was higher than that concerning the other domains. Some studies have shown

| Factors            | Item                                                                 | Standardized B | Coefficients B | SD Error | P value |
|--------------------|----------------------------------------------------------------------|----------------|----------------|----------|---------|
| Necessary care     | Moving patient three times a day or as prescribed                    | 0.455          | 1.000          |          |         |
|                    | Changing the patient's position every 2 h                            | 0.482          | 0.876          | 0.133    | 0.001   |
|                    | Serving a warm dish to the patient                                  | 0.602          | 1.257          | 0.188    | 0.001   |
|                    | Giving medications 30 min before or after a schedule                | 0.470          | 0.913          | 0.162    | 0.001   |
|                    | Taking vital signs as prescribed                                    | 0.805          | 1.500          | 0.229    | 0.001   |
|                    | Control of intake and output                                        | 0.745          | 1.352          | 0.212    | 0.001   |
|                    | Complete recording of all necessary data                            | 0.827          | 1.458          | 0.238    | 0.001   |
|                    | Educating the patient about disease, procedures, and diagnostic studies | 0.815          | 1.730          | 0.279    | 0.001   |
|                    | Washing hands                                                       | 0.604          | 1.297          | 0.229    | 0.001   |
|                    | Patient’s blood sugar monitoring as prescribed                       | 0.837          | 1.789          | 0.295    | 0.001   |
|                    | Evaluating the patient in each shift                                 | 0.839          | 1.795          | 0.282    | 0.001   |
|                    | Evaluating peripheral and central venous catheter based on hospital protocols | 0.867          | 1.791          | 0.293    | 0.001   |
|                    | Skin/ wound care                                                    | 0.783          | 1.893          | 0.300    | 0.001   |
| Supportive care    | Setting table for patients who eat by themselves                    | 0.368          | 1.000          |          | 0.001   |
|                    | Emotional support of patient and/or family                          | 0.718          | 2.119          | 0.507    | 0.001   |
|                    | Responding to the patient alarm within 5 min                        | 0.712          | 2.344          | 0.566    | 0.001   |
|                    | Administering PRN medication within 15 min                           | 0.852          | 2.505          | 0.638    | 0.001   |
|                    | Assisting the patients with toileting within 5 min after a request  | 0.830          | 2.574          | 0.623    | 0.001   |
| Secondary care     | Emotional support of patient and/or family                          | 0.282          | 1.000          |          | 0.001   |
|                    | Mouth care                                                          | 0.605          | 2.194          | 0.493    | 0.001   |
|                    | Discharge planning and the patient educating                        | 0.794          | 3.534          | 0.964    | 0.001   |
|                    | Focused reevaluation of the patient considering the patient’s condition | 0.836          | 3.456          | 0.971    | 0.001   |
|                    | Evaluation of drug effects                                          | 0.783          | 3.552          | 0.969    | 0.001   |
|                    | Attending interdisciplinary caring conferences                       | 0.594          | 2.456          | 0.692    | 0.001   |
| Connection and correlation | Standardized B | Coefficients B | SD Error | P value |
| Necessary care     | Supportive care                                                     | 0.980          | 0.112          | 0.038    | 0.003   |
| Supportive care    | Secondary care                                                      | 0.976          | 0.059          | 0.024    | 0.015   |
| Necessary care     | Secondary care                                                      | 0.998          | 0.084          | 0.029    | 0.004   |
| measurement error of A11 | measurement error of A12                                           | 0.377          | 0.161          | 0.035    | 0.001   |
| measurement error of A2 | measurement error of A1                                            | 0.397          | 0.198          | 0.041    | 0.001   |
| measurement error of A7 | measurement error of A6                                             | 0.399          | 0.085          | 0.017    | 0.001   |
that nurses feel more dissatisfied with their jobs when they cannot take care of their patients. In other words, the more missed nursing care in the unit, the higher the nurses’ dissatisfaction level about their job [17–19].

Emotional support for the patient and/or family, feeding patients when the food is still warm, and attending interdisciplinary care conferences whenever held were missed more often in their study [9]. However, Kalisch stated that ambulation three times per day or as ordered, turning patients every 2 h, and assessing the effectiveness of medications were missed more often in their study [2]. Handwashing was one of the least missed types of care in the United States and Turkey studies [2, 11].

The findings of our study showed that the reasons for missed nursing care were inefficient communication, labor resources, responsibility, unpredictable situations, and material resources, respectively. In some studies, such as those in the United States, Turkey, and Sweden, inefficient communication was the most fundamental

| Factor           | Item                                                                 | Standardized B | Coefficients B | SD Error | P    |
|------------------|----------------------------------------------------------------------|----------------|---------------|----------|------|
| Labor resource   | Low nurse staffing                                                   | 0.763          | 0.863         | 0.079    | 0.001|
|                  | The low number of assistant and office staff (for example assistant nurse, technician, secretary, etc.) | 0.618          | 0.866         | 0.093    | 0.001|
|                  | Inappropriate rate of patient to nurse                               | 0.705          | 1.000         |          |      |
| Material resource| Unavailability of drugs when needed                                  | 0.671          | 0.785         | 0.062    | 0.001|
|                  | Unavailability of needed devices                                     | 0.859          | 0.954         | 0.055    | 0.001|
|                  | Dysfunction of devices as needed                                     | 0.885          | 1.000         |          |      |
| Communication    | Not supporting by team members                                       | 0.726          | 0.840         | 0.061    | 0.001|
|                  | Tension or miscommunication with other wards                         | 0.870          | 0.983         | 0.056    | 0.001|
|                  | Tension or miscommunication in the nursing team                      | 0.824          | 1.067         | 0.065    | 0.001|
|                  | Tension or miscommunication with medical staff                       | 0.830          | 1.000         |          |      |
| Responsibility   | Inappropriate transfer from a previous shift or other wards          | 0.881          | 1.597         | 0.178    | 0.001|
|                  | Not giving required cares by other wards (for example the Physiotherapist has not moved the patient) | 0.831          | 1.505         | 0.171    | 0.001|
|                  | Not informing assistant nurse about missed cares                      | 0.658          | 1.197         | 0.115    | 0.001|
|                  | Leaving the ward or unavailability of nurse                          | 0.510          | 1.000         |          |      |
| Unpredictable situations | Emergency conditions (for example aggravation of the patient’s condition) | 0.694          | 1.020         | 0.101    | 0.001|
|                  | The unexpected increase in the number of patients or workload in the unit | 0.691          | 0.963         | 0.095    | 0.001|
|                  | The high number of hospitalizing and discharging                      | 0.691          | 1.000         |          |      |

| Connection and correlation |
|-----------------------------|
| Labor resource              | Material resource          | 0.390          | 0.204         | 0.041    | 0.001|
| Labor resource              | Communication              | 0.575          | 0.296         | 0.045    | 0.001|
| Labor resource              | Responsibility             | 0.515          | 0.161         | 0.031    | 0.001|
| Labor resource              | Unpredictable situations   | 0.886          | 0.339         | 0.045    | 0.001|
| Material resource           | Communication              | 0.576          | 0.409         | 0.055    | 0.001|
| Material resource           | Responsibility             | 0.680          | 0.293         | 0.045    | 0.001|
| Material resource           | Unpredictable situations   | 0.381          | 0.201         | 0.042    | 0.001|
| Communication               | Responsibility             | 0.622          | 0.265         | 0.043    | 0.001|
| Communication               | Unpredictable situations   | 0.600          | 0.312         | 0.046    | 0.001|
| Responsibility              | Unpredictable situations   | 0.572          | 0.181         | 0.033    | 0.001|
| measurement error of B16    | measurement error of B16   | 0.456          | 0.272         | 0.042    | 0.001|
reason for missed nursing care [2, 10, 11], but studies in Slovakia and Brazil reported that labor resources were the most critical reason in those countries [9, 12].

Limitations
This study was conducted in only one province, and the results may not be generalizable to all provinces due to the cultural diversity that exists among Iran’s different provinces. The participants were chosen from five units, and the results may differ in some units, such as the emergency department. Further study could focus on the development or psychometrics of a tool that assesses missed care from the patient’s perspective. Such a tool may be more helpful in identifying problems and their solutions.

Conclusion
The MISSCARE Survey- Persian version has good validity, reliability, and psychometric properties. It can help assess missed care in hospitals as well as the reasons care is missed. The MISSCARE Survey- Persian version also has different domains in the two parts of the survey, which can be helpful in better identifying the missed care and the exact reasons it happens. On the other hand, nursing managers might use this questionnaire to solve many problems related to caring and organization. This may result in provision of the best quality of care and satisfied nursing staff.

Abbreviations
Missed care: Care that is reduced, delayed, or eliminated; CVR: Content Validity Ratio; CVI: Content Validity Index; RMSEA: Root Mean Square Error of Approximation; CFA: Confirmatory factor analysis; GFI: Goodness of fit index; NFI: Normed Fit Index; CFI: Comparative Fit Index

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Table 4 The results of internal consistency in both parts of the survey

| Survey | Factor                  | N (question) | Cronbach’s Alpha | McDonald’s Omega coefficient |
|--------|-------------------------|--------------|------------------|------------------------------|
| Part A | Necessary care          | 13           | 0.890            | 0.900                        |
|        | Supportive care         | 5            | 0.745            | 0.780                        |
|        | Secondary care          | 6            | 0.794            | 0.800                        |
|        | **Part A**              | **24**       | **0.933**        | **0.940**                    |
| Part B | Labor resource          | 3            | 0.726            | 0.740                        |
|        | Material resource       | 3            | 0.837            | 0.850                        |
|        | Communication           | 4            | 0.884            | 0.890                        |
|        | Responsibility          | 4            | 0.829            | 0.830                        |
|        | Unpredictable situations| 3            | 0.734            | 0.730                        |
|        | **Part B**              | **17**       | **0.910**        | **0.910**                    |

Authors’ contributions
M, K, Z, H conceptualized the study, M, K, Z, H coordinated the project, Z, H; H, M completed data entry and analysis, and Z, H wrote the paper, and all authors approved the final manuscript.

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Availability of data and materials
The datasets used and analyzed during the current study are available from the author based on reasonable request.

Declarations
Ethics approval and consent to participate
This study was a master thesis. We started to collect data after getting approval from the Ardabil University of Medical Science. The study’s Approval ID was IR.ARUMS.REC.1398.307. We assured the participants that all their information would be kept confidential and that only the researchers would access it. We told them that their participation was voluntary and that they may withdraw from the study at any time. All methods were performed per the relevant guidelines and regulations.

Consent for publication
All authors gave consent to the publication of the manuscript.

Competing interests
The author declares no competing interest.

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