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The Relationship between Missed Nursing Care, Work Environment Conditions and Patient Safety Culture

Mahnaz Amiri Amjad [1], Simin Jahani [2*], Neda Sayadi [3], Bahman Cheraghian [4]

Abstract

Background: The rate of missed care depends on several factors which can affect the quality of care and treatment.

Aim: The present study was conducted with aim to investigate the relationship between missed care, work environment and patient safety culture.

Method: This cross-sectional study was conducted on 380 nurses working in the teaching hospitals affiliated to Jundishapur University of Medical Sciences in Ahvaz, Iran. Sampling was done through a stratified random sampling method from Jan 2019 to Jul 2020. The data collection tools included a demographic data form, the Missed Nursing Care Questionnaire, the Practice Environment Scale of the Nurse Work Index, and the Hospital Survey on Patient Safety Culture. Data were analyzed using SPSS software (version 25) and one way ANOVA, Pearson correlation and Kolmogorov-Smirnov tests. $p<0.05$ was considered statistically significant.

Results: Three most prevalent missed nursing care were overall patient assessment in each shift (96.1%), administering the drugs up to 30 minutes before or after the scheduled time (94.7%), and measuring the vital signs as ordered (94.1%). The mean scores of missed care were significantly higher among nurses with lower ages ($p<0.0001$) and less work experience ($p<0.0001$). A significant inverse correlation was found between missed care and the overall score of patient safety culture ($r= -0.22$, $p<0.0001$). Also, a significant correlation was found between missed care and the overall score of the work environment index ($r=0.285$, $p<0.0001$).

Implications for Practice: Nursing managers can reduce the rate of missed nursing care by improving the working conditions of nurses and educating them about patient safety.

Keywords: Environment, Missed care, Nursing care, Patient safety

1. MSc in Medical and Surgical Nursing, Nursing Care Research Center in Chronic Diseases, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
2. Associate Professor, Nursing Care Research Center in Chronic Diseases, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
3. Assistant Professor, Nursing Care Research Center in Chronic Diseases, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
4. Associate Professor, Department of Biostatics and Epidemiology, School of Public Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

* Corresponding Author Email: jahanisimin50@yahoo.com

Introduction

Receiving safe, comprehensive and high quality care and meeting care needs is a basic right of hospitalized patients. However, in situations of staff shortages, some care activities are often missed or omitted (1). Since nurses can only perform a limited number of tasks during a work shift, they prioritize care and decide which care is a priority and which care can be omitted, therefore, some care is missed (2). Missed care refers to any aspect of care which the patient needs but is overlooked or omitted. A model of missed care is presented which explains the role of structural factors such as hospital characteristics, ward conditions, staff- and patient-related factors, as well as the consequences of missed care. According to this model, caregivers' individual characteristics (such as age, gender, mental status, and education level), factors related to human resources (including shortage of nurses, workload, changes in working shifts, improper distribution of tasks, number of nursing tasks not completed by the nurse in previous shift, and lack of work experience), lack of financial resources, and teamwork and communication problems can lead to missed care (1,2). It has been shown that the nurse's work environment significantly affects the frequency of missed nursing care. Positive perception of the work environment reduces the rate of missed care, but the shortage of nursing staff and limited support and resources increase nurses' stress and burnout, leading to increased medical errors and missed care (3,4).

Missed care increases complications, lengthens hospital stays, reduces patient safety and satisfaction (5), and reduces hospital credibility (6). Missed care also increases the likelihood of medical errors, with about 13.5% of patients experiencing at least one preventable adverse event during their hospital stay (7). In one study, the rate of preventable injuries resulting from missed medical care was 40.2 adverse events per 1000 patient-days, this rate remained relatively unchanged over a five-year period (8). According to a report from the Institute of Medicine (IOM), 44000 to 98000 deaths occur due to medical errors in the United States every year (9). A study in Iran reported that the rate of missed nursing care was below average, however with proper management and reduced nurses' workload, the rate of missed care could be further reduced (10). Missed nursing care threats patient safety that should be considered in the development of national and regional policies at the global level. The culture of unsafe care is associated with complications such as pain and suffering, increased hospitalization duration, and treatment costs. These complications are not caused by the individual's primary disease, but are caused by the mistakes of the treatment team, including physicians and nurses, and finally impose costs on the patient (11).

Since the prevalence and adverse effects of missed care is high, it is necessary to examine the factors associated with its incidence in various healthcare settings (12). Some studies investigated the relationship between missed care and organizational factors such as leadership style (13), work environment (7), teamwork (14), patient safety culture (7), and organizational and workplace culture (15). Another study also examined the association between nursing work environment, patient safety, and missed nursing care (16). However, no study has examined the relationship between missed care and various demographic characteristics, nurses' work environment, and patient safety culture in Iranian hospitals. Therefore, the present study was conducted with aim to investigate the relationship between missed care and nurses' demographic characteristics, work environment, and patient safety culture in the teaching hospitals of Ahvaz, Iran.

Methods

This cross-sectional study was conducted in the teaching hospitals affiliated to Jundishapur University of Medical Sciences (i.e. Imam, Golestan, Razi, Abuzar, Taleghani, and Baqaei 2 hospitals) in Ahvaz, Iran. A total of 380 nurses working in the medical and surgical wards of the aforementioned hospitals participated in the study from Jan 2019 to Jul 2020. Considering to 10% attrition, the sample size was calculated to be 380 subjects. Sampling was done through a stratified random sampling method. First, the list of nurses working in each hospital was obtained from the hospitals' nursing offices. Then, the number of nurses needed from each hospital was calculated and the required number of nurses was randomly selected from the lists. Inclusion criteria were a bachelor's or higher degree in nursing, and working in the concerned department for at least 6 months. Exclusion criteria were either incomplete responding to the questionnaire or the nurse's decision to withdraw from the study. All methods were carried out in accordance with the relevant guidelines and regulations.

The tools for collecting data in this study included a demographic data form, the Missed Nursing Care

Questionnaire (MISSCARE), the Practice Environment Scale of the Nurse Work Index (PES-NWI), and the Hospital Survey on Patient Safety Culture (HSPSC). The demographic data form included the items on the nurses' age, gender, overall work experience, work experience in the current unit, education level, marital status, employment status, number of working hours per week, organizational position, work experience in the current position, working department, and usual working shift. The content validity of this form was confirmed by ten faculty members of the Nursing and Midwifery School.

The Missed Nursing Care Questionnaire (MISSCARE) has 24 items related to a list of missed nursing care activities, such as patient movement, rotation, evaluation, training, discharge planning, and drug administration. All items are scored on a four-point scale ranging from "1: rarely missed" to "4: always missed". The total scores range from 24 to 96, with a higher score showing a higher possibility of missed care. This questionnaire was developed and validated by Kalisch and Williams and its validity and reliability were respectively measured through the content validity index and Cronbach's alpha of 0.89% and 0.7 (17). The content validity index and Cronbach's alpha of the Persian translation of MISSCARE were reported by Khajooee et al. as 0.99 and 0.91, respectively (10).

The Practice Environment Scale of the Nurse Work Index (PES-NWI) is an instrument, which measures the nursing practice environment. The tool consists of 34 items in five subscales, including nurse participation in hospital affairs (11 items), planning quality care nursing (9 items), nurse Manager's support of nurses (7 items), adequate resources and staffing (4 items), and nurse-physician relationships (3 items) (18). All items are scored on a 4-point scale from "1: strongly disagree" to "4: strongly agree". Scores above 2.5 on each subscale indicate a favorable nursing practice environment. The PES-NWI was developed by Lake et al. and its Cronbach's alpha reliability was reported as 0.94 (19). In the study of Arab and colleagues, the validity of the tool was determined through giving the questionnaire to the faculty members and their corrective comments were applied. To determine the reliability of the tool, in a pilot project, the questionnaire was given to 53 working nurses and its reliability was estimated to be 0.88 using Cronbach's alpha test (20).

The Hospital Survey on Patient Safety Culture (HSPSC) consists of 42 items to measure the hospital's patient safety culture. The tool has 12 dimensions including the staff's perception of organizational learning and continuous improvement, manager's expectations and actions promoting patient safety, communication openness, teamwork within departments, feedback and communication about error and reporting error, non-punitive response to error, aequate staffing, teamwork between different departments, hospital management support for patient safety, hospital handoffs and transitions, overall perceptions of patient safety, and frequency of reporting event in the last 12 months. All items are scored on a 5-point Likert scale from "1: strongly disagree" to "5: strongly agree". Dimensions with a positive response of 75% or more are regarded as areas of strength. But dimensions with positive responses of 50% or less are considered as weak and needing intervention. The dimensions with positive scores between 50-75% are regarded as neutral (20,21). This questionnaire was designed by the US Agency for Quality and Health Research in 2004 (22). The Persian translation of the questionnaire was validated by Dehghani et al. with a content validity index of 79% and Cronbach's alpha of 0.85 (20).

After coordinating with the nursing office in each hospital, the researcher referred to the eligible people, introduced herself, explained the aims and process of the study, and provided them with copies of the data collection tools to respond to in a calm and private setting. The participants were asked to return the completed questionnaires to the researcher at the next visit. All participants signed a written consent form before participation and were assured about the confidentiality of their personal data. Data were analyzed using SPSS software (version 25) and one way ANOVA and Pearson correlation test. Kolmogorov-Smirnov test was also used to check the normality of quantitative data. The results showed that the data were statistically normal. $P<0.05$ was considered statistically significant.

Results

Out of 380 questionnaires, 36 were excluded due to incomplete answering and finally, 344 questionnaires were analyzed. The mean age and work experience of nurses were 33.94±4.98 and 3.32±1.06 years, respectively. Most of the participants were female (85.80%), married (76.50%), permanently employed (54.70%), and had an overall work experience of 6-10 years (34.30%) with

< 5 years of experience in the current ward (65.35%).

Three most prevalent missed nursing care were overall patient assessment in each shift (96.10%), administering the drugs up to 30 minutes before or after the scheduled time (94.70%), and measuring the vital signs as ordered (94.10%). However, the less common missed care was hand washing (66.50%). The mean scores of missed cares were significantly higher among nurses with lower ages ($p<0.001$) and less work experience ($p<0.001$). However, the mean missed care was not significantly different among males and females ($p=0.07$), and among nurses working in different workplaces ($p= 0.26$; Table 1).

Table 1. The mean score of missed care in terms of demographic variables of the participating nurses

Demographic characteristics	Missed nursing care		*p*-value
	N (%)	Mean ± SD	
Work place (hospital)			
Imam	90 (26.16)	37.9 ± 6.8	
Golestan	94 (27.32)	37.5 ± 9.4	
Razi	41 (11.91)	35.4 ± 6.3	0.26
Abouzar	46 (13.37)	37.7 ± 8.2	
Taleghani	30 (8.72)	38.8 ± 6.5	
Baghaei	43 (12.50)	35.6 ± 6.12	
Work experience (yr)			
≤5	84 (24.41)	39.7 ± 9.1	
6-10	118 (34.30)	37.9 ± 7.3	<0.001
11-15	92 (26.74)	37.1 ± 6.3	
≥16	50 (14.53)	32.0 ± 5.6	
Age (yr)			
<30	107 (31.10)	39.6 ± 8.7	
30-34	78 (22.67)	37.1 ± 6.9	<0.001
35-39	107 (31.10)	37.7 ± 6.4	
≥40	52 (15.11)	31.8 ± 6.3	
Gender			
Female	295 (85.80)	37.7 ± 7.5	0.07
Male	49 (14.20)	39.1 ± 8.4	

*One-Way ANOVA

Table 2 represents the relationship between missed care and dimensions of work environment. The results showed that there was a statistically significant and direct relationship between missed care and "all subscales" and "overall score" ($p<0.001$), except for "resources adequacy" ($p=0.064$). While in the subscale "nurse physician relations", the size of the correlation was 0.326 and the correlation was the low positive type, but in the subscales "participation", "planning", "support" and "overall score", the size of the correlation was 0.00 to 0.30 and the correlation was the negligible correlation type.

Table 2. The correlations between the scores of nurse's work environment index, its subscales, and missed care

Dimensions of work environment	Pearson correlation	*p*-value*
Participation	0.245	< 0.001
Planning	0.239	< 0.001
Support	0.199	< 0.001
Resources adequacy	0.10	0.064
Nurse-physician relations	0.326	< 0.001
Overall score	0.285	< 0.001

*Pearson correlation

Table 3 investigated the relationship between missed care and dimensions of patient safety culture questionnaire. The results showed that there was a statistically significant and inverse relationship between missed care and "information about working unit", "manager or supervisor of working

unit", "overall perceptions of patient safety" and "overall score" ($p<0.001$). While in the subscale "information about your working unit", the size of the correlation was -0.32 and the correlation was the low negative type, but in the subscales "manager or supervisor of your working unit", "overall perceptions of patient safety", and "overall score", the size of the correlation was 0.00 to 0.30 and the correlation was the negligible correlation type.

Table 3: The correlations between the scores of patient safety culture, its subscales, and missed care

Dimensions of patient safety culture questionnaire	Pearson correlation	*p*-value*
Information about working unit	-0.32	< 0. 001
Manager or supervisor of working unit	-0.16	0.003
Communication	-0.09	0.09
Frequency of event reporting in the last 12 months	-0.2	0.54
Overall perceptions of patient safety	-0.03	< 0. 001
Overall score	-0.22	< 0. 001

Pearson correlation

Discussion

The current study was conducted with aim to clarify the association between missed nursing care and the nurse's work environment and patient safety culture. The most prevalent missed care in this study were the overall assessment of the patient at each shift, administration of medications up to 30 minutes before or after the scheduled time, and the measurement of vital signs according to the physician's order. Studies reported inconsistent results about the most prevalent missed nursing care. A systematic review showed that care related to planning and communication were missed more often than clinical care (23). Also, Labrague et al. demonstrated that more prevalent missed care included adequate patient surveillance, comforting/talking with patients, and provision of skin care; some clinical aspect of care such as on time administration of medication and patient education were less missed (24). Cho and colleagues found that if nurses had to prioritize care due to lack of time or heavy workload, they selected three highest-priority activities including reassessments, timely medications, and patient teaching. Also, the three activities with the lowest priority were setting up meals, attending interdisciplinary care conferences, and mouth care (25). The differences between these findings and those reported in the previous studies might be attributed to the COVID-19 outbreak. Perhaps the overcrowding of the hospitals and shortage of nursing workforce during the epidemic prevented nurses of full patient assessment, on-time medication administration, and precise monitoring of vital signs.

In the present study, an inverse correlation was found between MISSCARE and HSPSC scores, but a direct association was observed between MISSCARE and PES-NWI scores. Consistent with present study, Kim et al. in a study on South Korean nurses also reported a significant correlation between missed care, workplace conditions, and patient safety culture (16). As reported by Fotoohi and colleagues, the nurse's work environment appears to play an important role in the quality and safety of care (26). It can be inferred that a credible organization emphasizes a safety culture, encourages evidence-based practice, and provides better working conditions for nurses. Nurses working in such an organization also make greater efforts to improve the quality and safety of care. According to the PES-NWI scores in the present study, the nurses enjoyed a favorable work environment. Although the dimensions of planning quality care nursing, and nurse Manager's support were less desirable than other dimensions. Kim et al. in their research reported that the work environment was considered unfavorable as only one factor of five was favorable (nursing foundations of quality care). Among the items related to planning quality care nursing, caring assignments which promote care continuity, caring for all patients based on written and updated nursing care plans, and having an active quality assurance program received the most frequent disagree responses. However, the items related to nurse managers' expectations and feedback, providing high quality nursing care, availability of opportunities for continuing training and professional development for active nurses, and performing nursing care based on the nursing process received the most positive responses (16).

In the present study, the patient safety culture was at the moderate-weak level, with the non-punitive response to errors and teamwork between hospital units receiving the lowest scores among the 12 dimensions. In a study by Lawati et al, patient safety in the primary health care setting was excellent

or very good and perceptions of patient safety were relatively positive. The highest score was related to "teamwork within units" and the lowest was related to "communication problems between the staff" (27). Akbari et al. found that the mean score of safety culture was unacceptably low. The highest score was related to "supervisor/manager expectations and actions promoting safety" and the lowest score was related to "frequency of event reporting" (28). Kim et al. found that missed care was correlated with nursing work environment and patient safety culture. Also, regression analysis showed that perception on patient safety culture was effective on missed nursing care (16). Managers' non-punitive response to errors improves nurses' performance in terms of patient safety (29). Also, it is necessary to train nurses to focus on patient interaction and cooperation to achieve appropriate care, improve the quality of care, improve facilities and equipment, and provide sufficient and efficient staff to improve patient safety (30).

The most important limitation of this research was the mental condition of nurses, especially due to the Covid 19 pandemic, which could affect answering the questions.

Implications for practice

The results of the present study showed that missed care is associated with nurses' work experience and age, and missed care decreases with more age and work experience. In addition, it is possible to reduce the rate of missed care among nurses by enhancing the safety culture and improving the working environment. In addition, nursing managers can reduce the rate of missed nursing care by improving the working conditions of nurses and educating them about patient safety. However, further research is needed to identify the factors affecting missed nursing care.

Acknowledgments

Conflicts of interest

The authors declared no conflict of interest.

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