



The Impact of Nursing Work Environment and Patient Safety Culture on Missed Nursing Care at Medical and Surgical Departments

Nafisa Moustafa Abdallah Elpasiony¹, Nagwa Gouda Ahmed Abd-Elmoghith²

¹Lecturer of Medical-Surgical and Critical Care Nursing, Faculty of Nursing, Beni-Suef University, Beni-Suef, Egypt

²Assistant Professor of Nursing Administration, Faculty of Nursing, Kafrelsheikh University, Egypt

Corresponding author: nafesa011124@nursing.bsu.edu.eg

ABSTRACT

Background: Missed nursing care associated with devastating effects for patients, nurses, organizations, and even country so we in great need to find causes to eliminate it and its consequences. **Aim:** to analyze the impact of nursing work environment and patient safety culture on missed nursing care at medical and surgical departments. **Methods:** A descriptive correlational research design used with a convenient sample of 200 nurses providing direct nursing care for patients. The data collected from medical and surgical departments at Kafrelsheikh University Hospital, Egypt. Four tools used: nurses' personal characteristics tool, misscare survey, practice environmental scale, and nurses' perception of patient safety culture scale. **Results:** About one third of the nurses occasionally missed ambulating patient as ordered, turning every two hours and patient teaching (29.5%, 27.5% and 25.5%) respectively. A statistically significant inverse correlation between total score of missed nursing care, and that of both work environment and patient safety culture ($r = -0.229^*$, $p=0.001^*$) and ($r = -0.217^*$, $p= 0.002^*$) respectively. **Conclusions and recommendations:** Nursing work environment and patient safety culture affect missed nursing care. It is vital to regularly examine the workplace to spot any elements that can lead to more missed nursing care. Additionally, it is crucial for nurses to have ongoing training.

Keywords: nursing work environment, patient safety culture, missed nursing care, medical/ surgical departments

Introduction

Licensed nurses have several roles e.g., care giver, leader, advocator, educator, and collaborator. Nurse as a care giver with other health team members help patients to promote health, prevent illness and disability (DeWit, Stromberg and Dallred, 2017). Nurses, caring patients at medical/surgical areas including intensive care units, require having a broad knowledge base, be competent in a variety of skills, and capable of managing large amounts of information as those patients have multiple comorbidities (Winsett et al., 2016).

As well, nurses require a healthy work environment. Studies showed a direct relationship between work environment and job satisfaction (Al Sabei, et al., 2020). Furthermore, the nurse work environment has an impact on the quality of care and patient safety (Aiken, et al., 2011). Nurses working environment factors such as inadequate staffing, or workload, insufficient resources, unexpected increase in number of patients, communication patterns, and the acuity of care needed have been correlated with patient outcomes (Hessels, Flynn, Cimiotti, Cadmus, & Gershon, 2015).

Patient safety is a crucial element of health care quality. A patient safety culture (PSC) characterized by a shared perspective among health care providers on the importance of safety, transparency in communications, fidelity, and shared trust in the effectiveness of preventive measures. It has accompanied with improved

patient outcomes, as a better PSC helps nurses to do the important tasks, they perform every day. All these factors can be an explanation of causes of missed nursing care. Missed nursing care is a “red flag” for inadequate staffing (Hessels, *et al.*, 2019; Diab, & Ebrahim, 2019; Andersson, Eklund, Nilsson, & Bååth, 2022).

Missed nursing care is defined as any aspect of required and standard nursing care that is not completed (Kalisch, Doumit, Lee, & Zein, 2013) which means missing some aspects of nursing care such as feeding, ambulation, turning patients. Each nursing care element may have a negative effect if not completed. Ambulation and turning as ordered may help a patient decrease health consequences of immobility, regain muscle strength and maintain balance, but if not completed, could increase the risk of fall and pressure ulcer (Smith, Morin, Wallace, & Lake, 2018). Lack of attention to mouth care may affect appetite or increase the risk for infection as gingivitis, and periodontitis and aspiration pneumonia (Willis, & Brady, 2022).

Additionally, missed nursing care can lead to medication errors, nosocomial infections like ventilator associated pneumonia, upper gastrointestinal bleeding, ‘failure to rescue’ incidents, and pulmonary complications (Kalisch, & Xie, 2014). These negative consequences can range from patient discomfort, various physical and psychological complications, increased hospital stay, readmission, and even death. Furthermore, nurses’ dissatisfaction and distress can result. Increased costs decreased

organizational credibility, absenteeism, intention to leave, and later turnover are the organization-related consequences (Janatolmakan, & Khatony, 2022).

Significance of the study

Complications of missed nursing care can reach mortality for example mortality rate from urinary tract infection, surgical site infection, blood stream infection, and pneumonia were 30.8%, 89.0%, 23.8-50%, and 14.8-71% respectively according to (Sheykhsaran, et al. 2022). According to Ball, et al., (2018) missed care measurement could serve as an "early warning" sign showing a higher liability of negative patient outcomes. These negative consequences forced the researchers to analyze nurses work environment and nurses' perception of patient safety culture to identify causes of missed nursing care in order to increase attention of nurses toward its dangerous outcomes.

Aim of the study

The study aimed to analyze the impact of nursing work environment and patient safety culture on missed nursing care at medical and surgical departments.

Research questions:

1. What is the prevalence of missed nursing care?
2. What are the causes of missed nursing care from nurses' point of view?

3. What are the factors in the nursing work environment that may cause missed nursing care?
4. What is the nurses' perception of patient safety culture?
5. Is there any relation between missed nursing care and both nursing work environment and patient safety culture?

Subjects and Methods

Study design

A descriptive correlational research design was conducted.

Study setting

The study was conducted in Kafrelsheikh University Hospital, in delta region of Egypt, from units of general and specific medical and surgical departments including intensive care units. It is composed of 6 floors with total bed capacity of 400 beds.

Study subjects:

A convenient sample of 200 nurses responsible for providing direct nursing care to patients, working at the previous mentioned departments, accepted to participate in the study, no age limit, and they had at least one year of experience in nursing.

Sample size calculation was statistically calculated using Steven Thompson (2012) equation.

$$n = \frac{N \times p(1 - p)}{\left[(N - 1) \times \left(\frac{d^2}{Z^2} \right) + p(1 - p) \right]}$$

n = Sample size

N=Total staff nurses' size

d = error proportion (0.05)

p = probability (50%)

Z = Confidence level at 95% (1.96)

Total size of nurses was 399 so the sample size calculated to be 197 nurses and increased to 200 to avoid dropout.

Tools of data collection

After the construction of the tool, translated into Arabic language to be easy for nurses to fill. Four tools were used for data collection.

- **Tool I nurses' personal characteristics tool:** It was developed by the researchers and included nurses' age, gender, marital status, educational level, years of experience, working unit, and attending training courses regarding patient safety.
- **Tool II misscare survey:** It was adopted from (Kalisch et al., 2011), used to find missed nursing care and reasons for it. It consisted of two parts.
- **Part one:** It was concerned with nursing care that are needed for patients and not provided by nurses. The total items were twenty-four items which were divided into 4 subcategories: Assessment (8 items), Interventions-individual needs (6 items), Intervention-basic care (7 items), and Planning (3 items). Nurses were asked to check the response from five items Likert scale; Never missed, rarely missed,

occasionally missed, often missed or always missed.

- **Part two:** It was included nurses' opinion about reasons of missed nursing care. Nurses were asked to indicate the reason of missed nursing care.

Scoring System:

Nurses' responses were scored on a five-point Likert scale ranging from (0) Never missed to (4) Always missed. High score indicates increased missed nursing care. The frequency of missed care was considered high if the percent score was more than 75%, moderate if the percent score ranged from 60 to 75%, and low if the percent score was less than 60%.

- **Tool III Practice environmental scale:** The tool was adopted from (Lake, 2002) translated and validated by the researchers to measure the working conditions, characteristics that interrupt the nurses' professional work. Total items were twenty-eight, which consisted of five categories, as the following: Nurses' participation in hospital affairs (8 items), Nursing foundations for quality of care (9 items), Nurse manager ability, leadership, and support of nurses (4 items), Staffing and resource adequacy (4 item), and Collegial nurse physician relations (3 items).

Scoring system:

Nurses checked responses through a five points Likert scale from 1 (strongly disagree)

to 5 (strongly agree), the high score denotes positive work environment. Scores of each category summed up and converted into percent scores. The work environment was considered highly positive if the percent score was more than 75%, moderately positive if the percent score ranged from 60 to 75%, and negative if the percent score was less than 60%.

- **Tool IV Nurses' Perception of patient safety culture scale:**

The scale adopted from (Agency for Healthcare Research and Quality, 2003), translated and validated by the researchers, to measure the values, perceptions, attitudes of nurses that indicate their commitment to the style and the proficiency of the organization's health and safety management. Total items are 28 items. This instrument consists of three subdomains: the perception of patient safety culture within a work area/unit (18 items); supervisor\manager (4 items), perception of communication on patient safety (6 items).

Scoring system:

Nurses rated each item on 5-likert scale, from 1 (strongly disagree), 2 (disagree), 3 (undecided), 4 (agree), and 5 (strongly agree) with higher scores indicating more positive perceptions of patient safety. Scores of each category summed up and converted into percent scores. The perception of patient safety culture was considered high if the percent score was more than 75%, moderate if the percent score ranged from 60 to 75%, and low if the percent score was less than 60%.

Tools validity and reliability:

Tools are standard but as the researchers translated it into Arabic, it was revalidated. Validity of the content was evaluated through one expert in medical-surgical nursing and two experts in nursing administration to ensure clarity and relevance. Furthermore, a Cronbach's Alpha test used to decide reliability of the tools. The Cronbach's alpha test of the tools were as follow: misscare scale was (0.87), practice environmental scale was (0.962), and it was (0.949) for nurses' perception of patient safety culture scale.

Pilot study: was conducted on 10% of the total study subjects (20 staff nurses) over a period of one month to ascertain clearance and applicability of the tools. The participants of pilot study not included in the study.

Administrative Design: An official letter was issued from the Dean of Faculty of Nursing at Kafrelsheikh University to the director of Kafrelsheikh University Hospital to ease data collection and process of the research.

Ethical considerations: Ethical approval obtained from ethical committee of faculty of nursing Kafrelsheikh University, to implement the study. Approval from responsible authority, and head nurse also obtained before conducting the study. Staff nurses in the previously mentioned units involved in the study were explained the nature and purpose of study and informed that participation in the study was completely optional. They had the right to withdraw from the study at any time without

giving any reason. In addition, a written informed consent was obtained from each nurse in the study after assuring confidentiality as the researchers only had the right to access to participants' data.

Fieldwork:

Data were collected from January to the end of November 2022. The directors of the previously stated settings gave their approval to conduct the study, and the staff nurses agreed to participate. In the beginning, the researchers interviewed the staff nurses in the study setting at different shifts (morning, and afternoon shifts) to give them a brief idea about the study and its purpose. This was conducted individually or in groups. After that, the researchers distributed the questionnaire to the participated staff nurses, who were asked to fill in work times that had been pre-determined with the head nurse of each unit based on the type of work and workload. Data were collected three days / week in the presence of the researchers. Each questionnaire took about 15 minutes to complete. The researchers answer all nurses' questions. The completed forms were gathered on time and double-checked for accuracy to ensure that no data were missed.

Statistical analysis:

Data were fed to the computer and analyzed using the IBM SPSS software package, version 20.0. (Armonk, NY: IBM Corp.) Qualitative data were described using numbers and percents. The Kolmogorov-Smirnov test was used to verify the

normality of the distribution. Quantitative data were described using the mean and standard deviation. Significance of the obtained results were judged at the 5% level. The correlation between two normally distributed quantitative variables was done using the Pearson coefficient test, and reliability statistics were assessed using Cronbach's alpha test.

Results:

Table (1) showed that female nurses account more than two thirds of the nurses participated in the study (78.0%), and two thirds (60%) were between the age of 25<35 years old. Regarding educational level, most nurses (82.5%) were bachelor's degree. While the marital status, almost equal the nurse's status as single and married (49.5%, and 49%) respectively. Two to less than 5 years accounts about one third of nurses (36.0%). Also, about one third of nurses (32.0%) attend training courses, 50.0% of the courses were about patient safety.

Figure (1) illustrated that near half of the nurses worked in intensive care units (ICU) (47.5%) followed by (20.5%) which represent nurses of medical departments and (11.5%) were operating room (OR) nurses.

Table (2) revealed the prevalence of missed nursing care. Never missed nursing care items range only from 8.5% to 17% and the rest missed by different degrees. About one third of the nurses occasionally missed ambulation patient as ordered, turning every two hours and patient teaching (29.5%, 27.5% and 25.5%) respectively. Also, 23.0% mouth care, 19.0% patient bathing

and skin care, and 20% patient assessment every shift occasionally missed. Furthermore, 15.5% missed hand washing occasionally.

Nurses' opinions of causes of missed nursing care revealed that poor capabilities of nurses were the highest cause 63.0%, followed by small number of nurses 60.0%. Furthermore, 43.5% because of lack of nursing competence, 38.0% due to increased number of entry cases, and a shortage in the number of nursing assistants was about one third 30%, and the lowest number (3%) was others like nurses not dealing with each other appropriately as displayed in **figure (2)**.

Table (3) reported that overall missed nursing care was about one third of nurses with mean \pm SD (30.94 \pm 13.36%). The most missed nursing care was in the planning section with mean \pm SD (34.75 \pm 18.17%), while the least missed nursing care was in the assessment section with mean \pm SD (28.14 \pm 13.05%).

Table (4) illustrated that the overall percent score of the nursing work environment was (Mean \pm SD= 51.80 \pm 21.56). The highest subscale was Collegial nurse physician relations with (Mean \pm SD =60.75 \pm 25.97) but the lowest subscale was staffing and resource adequacy with (mean \pm SD =41.87 \pm 27.32).

Perception of patient safety culture illustrated in **table (5)**, as the overall percent score was

(Mean \pm SD= 56.80 \pm 14.83). The maximum subscale was perception of patient safety culture within unit with (Mean \pm SD= 59.95 \pm 15.20), followed by Communication with (Mean \pm SD= 53.02 \pm 19.53). The lowest subscale was supervisor/ manager with (Mean \pm SD=48.31 \pm 19.86).

The correlation between subscales of missed nursing care and all the subscales of nursing work environment and patient safety culture represented a significant negative correlation as stated in **table (6)**.

Figure (3) illustrated an inverse correlation between total score of missed nursing care, and that of work environment and patient safety culture with a statistically significant difference ($r = -0.229^*$, $p=0.001^*$) and ($r = -0.217^*$, $p=0.002^*$) respectively. This means that negative work environment and patient safety culture associated with increased missed nursing care and vice versa.

Table (1): Distribution of the studied nurses according to demographic data (n=200)

Demographic data	No.	%
Gender		
Female	156	78.0
Male	44	22.0
Age (year)		
18<25	61	30.5
25<35	120	60.0
35<45	19	9.5
Education		
Diploma	3	1.5
Technical institute	24	12.0
Bachelor	165	82.5
Master	8	4.0
Marital status		
Single	99	49.5
Married	98	49.0
Divorced	3	1.5
Experience		
< 2 years	67	33.5
2<5 years	72	36.0
5<10 years	33	16.5
10 or more	28	14.0
Attend training courses		
Yes	64	32.0
No	136	68.0
Training course	(n = 64)	
Patient safety	32	50.0
Infection control	20	31.25
First aid	8	12.5
Quality of nursing care	4	6.25
Who train you	(n = 64)	
Physicians	30	46.9
Nurses	33	51.6
Others	1	1.6

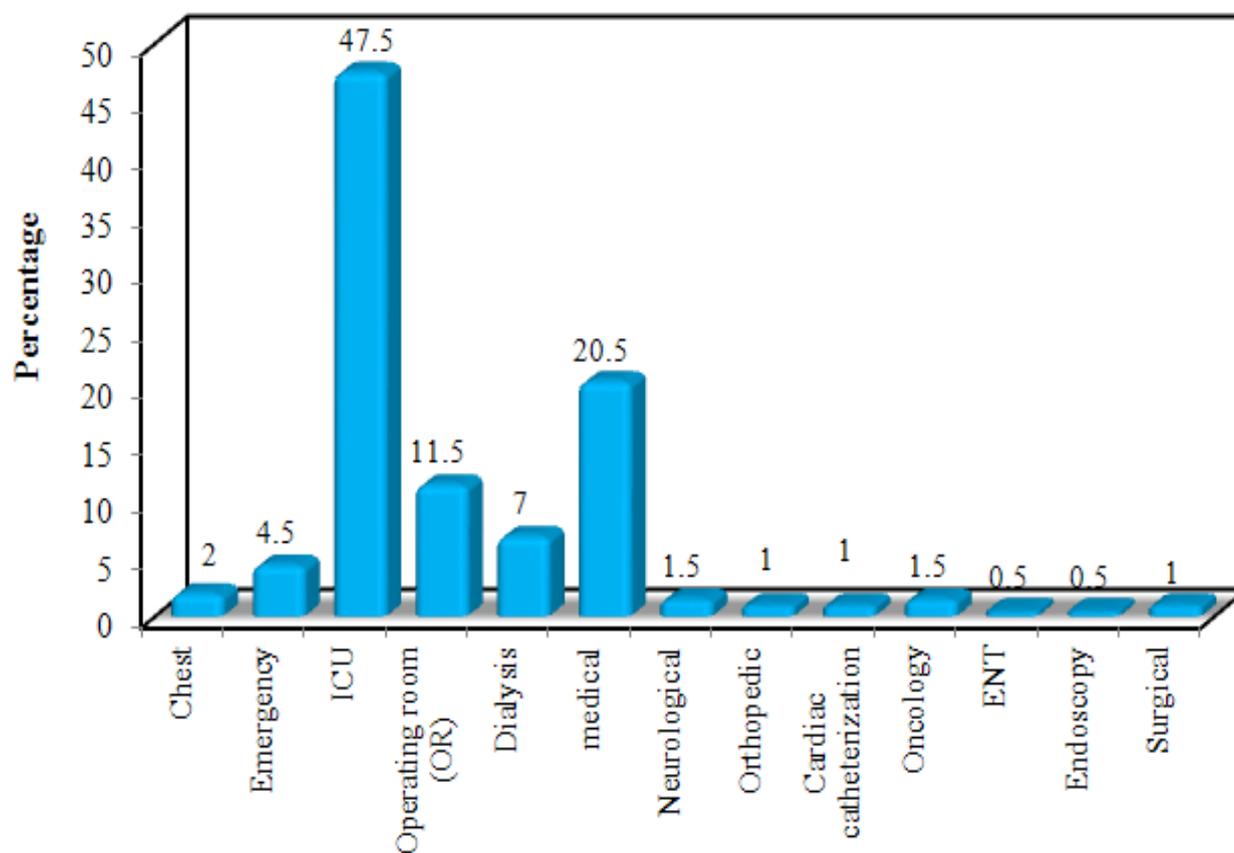
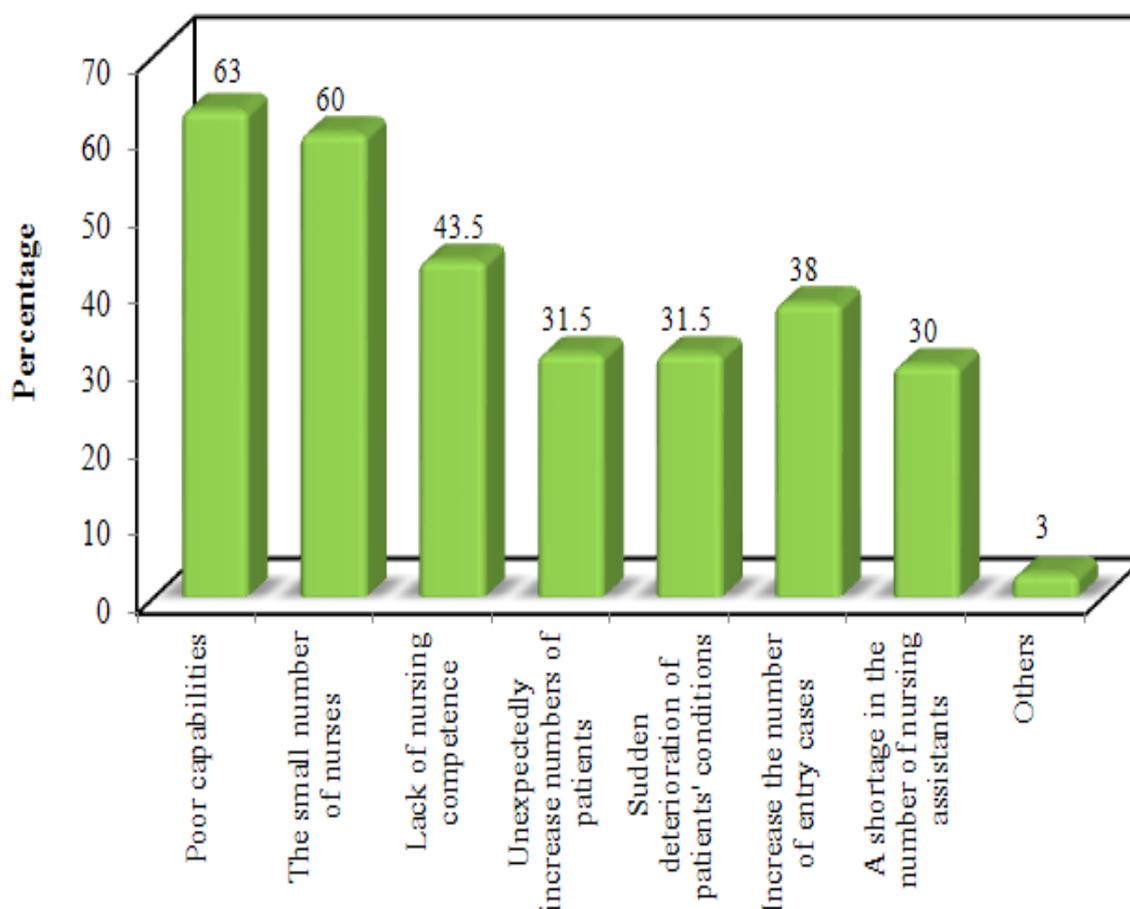


Figure (1) Percent distribution of nurses according to working units (n=200)

Table (2): Distribution of the studied nurses according to missed nursing care items (n=200)

Q	Missed nursing care	Never missed		Rarely missed		Occasionally missed		Frequently missed		Always missed	
		No.	%	No.	%	No.	%	No.	%	No.	%
	Assessment										
1	Full documentation of necessary data.	25	12.5	140	70.0	28	14.0	5	2.5	2	1.0
2	Assessment and care of IV site as hospital policy.	25	12.5	132	66.0	36	18.0	5	2.5	2	1.0
3	Intake\output monitoring.	24	12.0	137	68.5	31	15.5	7	3.5	1	0.5
4	Assess vital signs as ordered.	34	17.0	142	71.0	19	9.5	4	2.0	1	0.5
5	Focused reassessment according to condition of patient.	22	11.0	123	61.5	43	21.5	9	4.5	3	1.5
6	Wash hands continuously.	28	14.0	127	63.5	31	15.5	12	6.0	2	1.0
7	Monitoring blood glucose at bedside as ordered.	28	14.0	133	66.5	32	16.0	6	3.0	1	0.5
8	Perform patient assessment each shift.	27	13.5	124	62.0	39	19.5	7	3.5	3	1.5
	Interventions-individual needs										
9	Assess medications effectiveness.	23	11.5	109	54.5	51	25.5	13	6.5	4	2.0
10	Requests of PRN medication acted on within five minutes.	26	13.0	117	58.5	44	22.0	11	5.5	2	1.0
11	Administer medications within 30 minutes before or after scheduled time.	28	14.0	115	57.5	47	23.5	6	3.0	4	2.0
12	Assist with toileting needs within five minutes.	15	7.5	99	49.5	68	34.0	11	5.5	7	3.5
13	Response to patient request is provided within five minutes.	20	10.0	123	61.5	44	22.0	9	4.5	4	2.0
14	Providing emotional support to patient and \or his family.	24	12.0	137	68.5	27	13.5	7	3.5	5	2.5
	Interventions- basic care										
15	Ambulate patients three times daily or as ordered.	20	10.0	104	52.0	59	29.5	13	6.5	4	2.0
16	Turning patients every two hours.	23	11.5	107	53.5	55	27.5	9	4.5	6	3.0
17	Providing mouth care for patients.	19	9.5	116	58.0	46	23.0	11	5.5	8	4.0
18	Feeding patients when the food is still warm.	19	9.5	123	61.5	42	21.0	12	6.0	4	2.0
19	Providing bathing\skin care for patients.	25	12.5	123	61.5	38	19.0	12	6.0	2	1.0
20	Wound care.	31	15.5	140	70.0	22	11.0	5	2.5	2	1.0
21	Introducing meals for patients who feed themselves.	24	12.0	129	64.5	32	16.0	12	6.0	3	1.5
	Planning										
22	Health teaching for patients.	26	13.0	109	54.5	51	25.5	11	5.5	3	1.5
23	Participate in any interdisciplinary care conferences that are held.	17	8.5	90	45.0	60	30.0	28	14.0	5	2.5
24	Ensuring discharge planning.	23	11.5	118	59.0	37	18.5	16	8.0	6	3.0



More than one answer

Figure (2) Percent scores of causes of missed nursing care (n=200)

Table (3) Total mean and standard deviation score of subitems of missed nursing care (n=200)

Missed nursing care	Total Score	% Score
I- Assessment	(8-32)	
Mean \pm SD.	9.01 \pm 4.18	28.14 \pm 13.05
II- Interventions-individual needs	(6-24)	
Mean \pm SD.	7.68 \pm 3.67	32.02 \pm 15.30
III- Interventions- basic care	(7-28)	
Mean \pm SD.	8.84 \pm 4.24	31.57 \pm 15.15
IV- Planning	(3-12)	
Mean \pm SD.	4.17 \pm 2.18	34.75 \pm 18.17
Overall missed nursing care	(24-96)	
Mean \pm SD.	29.70 \pm 12.82	30.94 \pm 13.36

Table (4) Total mean and standard deviation scores of factors in nursing work environment (n=200)

Work environment factors	Total Score	% Score
I-nurses' participation in hospital affairs Mean \pm SD.	(8-40) 22.82 \pm 7.61	46.31 \pm 23.77
II. Nursing foundations for quality of care Mean \pm SD.	(9-40) 30.07 \pm 8.62	58.53 \pm 23.95
III. Nurse manager ability, leadership, and support of nurses Mean \pm SD.	(4-20) 12.14 \pm 4.45	50.88 \pm 27.82
IV. Staffing and resource adequacy Mean \pm SD.	(4-20) 10.70 \pm 4.37	41.87 \pm 27.32
V. Collegial nurse physician relations Mean \pm SD.	(3-15) 10.29 \pm 3.12	60.75 \pm 25.97
Overall Work environment Mean \pm SD.	(28-140) 86.02 \pm 24.14	51.80 \pm 21.56

Table (5) Total mean and standard deviation scores of patient safety culture (n=200)

Patient safety culture	Total Score	% Score
Perception of patient safety culture within unit Mean \pm SD.	(18-90) 61.17 \pm 10.95	59.95 \pm 15.20
Supervisor/Manager Mean \pm SD.	(4-20) 11.73 \pm 3.18	48.31 \pm 19.86
Communication Mean \pm SD.	(6-30) 18.73 \pm 4.69	53.02 \pm 19.53
Overall Patient safety culture Mean \pm SD.	(28-140) 91.62 \pm 16.61	56.80 \pm 14.83

Table (6) Correlation between total of missed care with work environment and patient safety culture dimensions (n=200)

			Missed nursing care			
			I- Assessment	II- Interventions- individual needs	III- Interventions- basic care	IV- Planning
Work environment	I-nurses' participation in hospital affairs	r	-0.102	-0.152*	-0.164*	-0.207*
		p	0.149	0.031*	0.020*	0.003*
	II. Nursing foundations for quality of care	r	-0.176*	-0.214*	-0.179*	-0.216*
		p	0.013*	0.002*	0.011*	0.002*
	III. Nurse manager ability, leadership, and support of nurses	r	-0.170*	-0.194*	-0.167*	-0.189*
	p	0.016*	0.006*	0.018*	0.007*	
	IV. Staffing and resource adequacy	r	-0.164*	-0.188*	-0.148*	-0.131
		p	0.020*	0.008*	0.037*	0.064
	V. Collegial nurse physician relations	r	-0.238*	-0.239*	-0.233*	-0.096
		p	0.001*	0.001*	0.001*	0.176
Patient safety culture	Patient safety culture within unit	r	-0.177*	-0.178*	-0.184*	-0.176*
		p	0.012*	0.012*	0.009*	0.013*
	Supervisor/Manager	r	-0.108	-0.141*	-0.176*	-0.130
		p	0.129	0.046*	0.013*	0.066
	Communication	r	-0.132	-0.208*	-0.194*	-0.171*
		p	0.063	0.003*	0.006*	0.015*

r: Pearson coefficient

*****: Statistically significant at $p \leq 0.05$

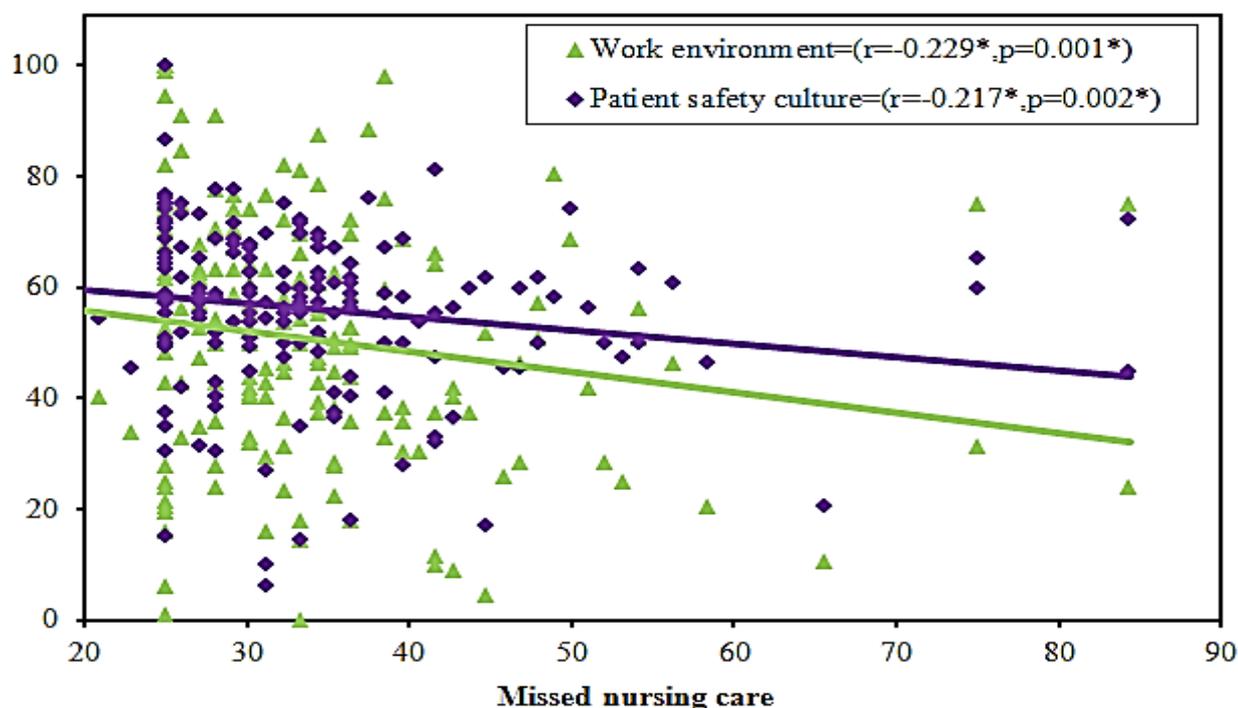


Figure (3) Correlation between total score of missed care with work environment and patient safety culture (n=200)

Discussion:

In the last ten years, missed nursing care was affected by characteristics such as "staffing and resource adequacy" and "nurse management skills, leadership, and support of nurses," among other aspects of the nursing work environment. Other influential factors included the overall view of "patient safety culture inside the unit" and nurses' clinical careers (Kim, Yoo and Seo, 2018).

The current study showed that more than two thirds of participants were female, because generally female nurses were more than male, had an age group $25 < 35$ years, whereas the most of them have a bachelor's degree with almost equal marital status as single and married, and

about one third of them had between two to five years' experience and attend training courses.

Furthermore, near half of the nurses worked in intensive care units because the ICU nursing staff have a lot of patient care provided and need ensure adequate mixed skill staffing that directly affected patient outcomes. These findings congruent with Kim et al (2018) who reported that more than half of studied nurses working in an ICU.

Additionally, the current study showed that one third of nurses occasionally missed ambulation, teaching, turning patients, mouth care, skin care and patient assessment every shift that may be due to the decreased nurses' number which leads to increase nursing workload specially with sudden increase of patients'

number as displayed in figure 2. This is in line with Ibrahim and Habieb, (2020) who said that the highest missed nursing care was ambulating patients three times daily. Also, Saqer and AbuAlRub (2018) who indicated that the most often reported forms of missed nursing care were patient turning, timely feeding, oral care, and patient ambulation.

As well as it was revealed that the highest causes of missed nursing care according to nurses' opinion were poor nursing capabilities. This returns to inadequate in-service training as evidenced in table 1 as only one third attend training courses, while a shortage in the number of nursing assistants represents lower frequency. Earlier studies also found that nursing field should ensure recruit adequate staffing that have a resources management and nursing capabilities because that a major reason for missed nursing care (Cho, et al. 2015).

Assessment, and intervention-basic care had less missed opportunities when compared to the interventions-individual needs and planning these results is consistent with the results of other studies (Hammad *et al.*, 2021; Kalisch and Xie, 2014). They found that the assessment dimension, had less missed care when compared with planning, while they reported that the findings related to individual needs had a high score compared with basic needs dimensions. Possible explanations for this finding are that those dimensions that respondent perceives as important from the nursing prespectives.

Missed nursing care forced the researchers to analyze working environment to identify the causes. The current study revealed that the highest positive score was for collegial nurse physician relation followed by nursing foundations for quality of care while, the lowest score for staffing and resource adequacy. This may be due to increase workload and shortage of staff make a good relation between nurses and physicians through contact with each other during providing patients care. These findings are parallel with (Moisoglou et al, 2020) who revealed that the nursing participants recorded high respondent to the collegial nurse physician relation, while staffing and resources adequacy dimension had the lowest score.

Otherwise, it was contradicted with Ibrahim and Habieb, (2020) who showed that the highest perception was for nursing foundation for quality of care followed by nurses' participation in hospital affairs then, lowest perception was for collegial nurse and physician relation followed by staffing and resource adequacy dimension. In addition, Almuhsen et al. (2017) a study of the nursing staff at King Fahd Medical City in Saudi Arabia found that the study's nursing staff perceived their workplace as having high levels of nursing foundation for high-quality of care and low levels of collegial nurse-physician connections.

As well, the present study found that more than half of nursing participants had good perception toward patient safety culture, while the highest perception of patient safety culture within

unit, then followed by communication whereas, the lowest score was supervisor/manager. this perception may be because each nursing unit is distinct and because each unit manages its own safety culture, this has a bigger influence on staff members' behavior. It is crucial for bedside nurses to discuss safety concerns they come across in the course of their job and offer solutions for enhancing the patient safety culture.

Similarly, Ibrahim and Habieb, (2020) who reported that the most nurses had good perception toward patient culture. In the same line the study of Ricklin, Hess, and Hautz (2019), and Ali et al (2018) supported these findings. Whereas these finding disagreed with Abdi et al, (2015) who showed that none of the patient safety culture domains had a successful culture, and that all the domains needed improvement. Also, Putri et al (2018) explored that communication report a positive effect on the readiness to report patient safety incidents.

According to literature nursing work environment, and patient safety culture had inverse correlation with missed nursing care (Al-Dossary, 2022). This is consistent with study findings as the correlation between subscales of missed nursing care and all the subscales of nursing work environment and patient safety culture stood for a significant negative correlation. And so total score of missed nursing care had a statistically negative correlation with both nursing work environment and patient safety culture this because the work environment and

patient safety culture are the key significant factors influencing missed nursing care.

Similarly, to Kim, Yoo and Seo, (2018) who found that there was a significant negative association between total and subscales of missed nursing care and both nursing work environment, and patient safety culture. In the same context with the study of Zeleníková, Jarošová and Janíková (2020) who showed that nursing work environment linked negatively with missed nursing care.

Conclusions:

The results concluded that there was a strong relation between both negative nursing work environment, patient safety culture and missed nursing care.

Recommendations:

Missed nursing is a universal challenge that faces patients, caregivers, and institutions in numerous ways. Therefore, it is crucial to monitor work environment frequently to identify any factors that can increase missed nursing care. Additionally, continuing training for nurses is essential. As well, further research is important to explore the consequences of missed nursing care on patients.

Limitations of the study:

Heavy workload of nurses leads to delay nurses' response to fill the questionnaire which led to a longer collection time data.

Abbreviations:

IV: Intravenous
PRN: when necessary

Acknowledgments

We would like to acknowledge the nurses in the study setting for their assistance and support to accomplish this research.

Funding:

There was no external funding for this research.

Declaration of Conflicting Interests

Authors declared no potential conflicts of interest of the research or its publication.

References:

- Abdi, Z., Delgoshaei, B., Ravaghi, H., Abbasi, M., & Heyrani, A. (2015). The culture of patient safety in an Iranian intensive care unit. *Journal of nursing management*, 23.543-555 (5).
- Agency for Healthcare Research and Quality. (2003). Rockville, MD. Hospital Survey on Patient Safety Culture. Content last reviewed November 2022. Available online at <https://www.ahrq.gov/sops/surveys/hospital/index.html>
- Aiken, L. H., Cimiotti, J. P., Sloane, D. M., Smith, H. L., Flynn, L., & Neff, D. F. (2011). The effects of nurse staffing and nurse education on patient deaths in hospitals with different nurse work environments. *Medical care*, 49(12), 1047. <https://doi.org/10.1097/MLR.0b013e3182330b6e>
- Al Sabei, S. D., Labrague, L. J., Miner Ross, A., Karkada, S., Albashayreh, A., Al Masroori, F., & Al Hashmi, N. (2020). Nursing work environment, turnover intention, job burnout, and quality of care: The moderating role of job satisfaction. *Journal of Nursing Scholarship*, 52(1), 95-104. <https://doi.org/10.1111/jnu.12528>
- Al-Dossary, R. (2022). The effects of nursing work environment on patient safety in Saudi Arabian hospitals. *Frontiers in Medicine*, 2131
- Ali, H., Ibrahim, S. Z., Al Mudaf, B., Al Fadal, T., Jamal, D., & El-Jardali, F. (2018). Baseline assessment of patient safety culture in public hospitals in Kuwait. *BMC health services research*, 18(1), 1-12.
- Almuhsen, F., Alkorashy, H., Baddar, F., & Qasim, A. (2017). Work environment characteristics as perceived by nurses in Saudi Arabia. *International Journal of Advanced Nursing Studies*, 6(1), 45. <https://doi.org/10.14419/ijans.v6i1.7453>.
- Andersson, I., Eklund, A. J., Nilsson, J., & Bååth, C. (2022). Prevalence, type, and reasons for missed nursing care in municipality health care in Sweden—A cross sectional study. *BMC nursing*, 21(1), 1-9. <https://doi.org/10.1186/s12912-022-00874-6>
- Ball, J. E., Bruyneel, L., Aiken, L. H., Sermeus, W., Sloane, D. M., Rafferty, A. M., ... & RN4Cast Consortium. (2018). Post-operative mortality missed care and nurse staffing in nine countries: A cross-sectional study. *International journal of nursing studies*, 78, 10-15.
- Cho S-H, Kim Y-S, Yeon KN, You S-J, & Lee ID. (2015). Effects of increasing nurse staffing on missed nursing care. *Int Nurs Rev*. 62(2):267e74. <https://doi.org/10.1111/inr.12173>
- DeWit, S., Stromberg, H. and Dallred, C., (2017). *Medical-surgical nursing: Concepts & Practice*. 3rd ed. United states of America: Elsevier Health Sciences, pp.1,2.
- Diab, G. M. A. E. H., & Ebrahim, R. M. R. (2019). Factors leading to missed nursing care among nurses at selected hospitals. *Am J Nurs Res*, 7(2), 136-147.
- Hammad, M., Guirguis, W., & Mosallam, R. (2021). Missed nursing care, non-nursing tasks, staffing adequacy, and job satisfaction among nurses in a teaching hospital in Egypt. *Journal of the Egyptian Public Health Association*, 96(1), 1-9.

- Hessels, A. J., Flynn, L., Cimiotti, J. P., Cadmus, E., & Gershon, R. R. (2015). The impact of the nursing practice environment on missed nursing care. *Clinical nursing studies*, 3(4), 60. <https://doi.org/10.5430/cns.v3n4p60>
- Hessels, A., Paliwal, M., Weaver, S. H., Siddiqui, D., & Wurmser, T. A. (2019). Impact of patient safety culture on missed nursing care and adverse patient events. *Journal of nursing care quality*, 34(4), 287. <https://doi.org/10.1097/NCQ.0000000000000378>
- Ibrahim, I., & Habieb, E. (2020). Associations between nursing work environment, patient safety culture, and missed nursing care among staff nurses. *Port Said Scientific Journal of Nursing*, 265- 284. Vol.7 (3)
- Janatolmakan, M., & Khatony, A. (2022). Explaining the consequences of missed nursing care from the perspective of nurses: a qualitative descriptive study in Iran. *BMC nursing*, 21(1), 1-7. <https://doi.org/10.1186/s12912-022-00839-9>
- Kalisch, B. J., & Xie, B. (2014). Errors of omission: missed nursing care. *Western journal of nursing research*, 36(7), 875-890. <https://doi.org/10.1177/0193945914531859>
- Kalisch, B. J., Doumit, M., Lee, K. H., & Zein, J. E. (2013). Missed Nursing Care, Level of Staffing, and Job Satisfaction. *The Journal of nursing administration*, 43(5), 274-279. <https://doi.org/10.1097/NNA.0b013e31828eebaa>
- Kalisch, B. J., Tschannen, D., Lee, H., & Friese, C. R. (2011). Hospital variation in missed nursing care. *American Journal of Medical Quality*, 26(4), 291-299. <https://doi.org/10.1177/1062860610395929>
- Kim, K. J., Yoo, M. S., & Seo, E. J. (2018). Exploring the influence of nursing work environment and patient safety culture on missed nursing care in Korea. *Asian nursing research*, 12.122-121, (2).
- Lake, E. T. (2002). Development of the practice environment scale of the nursing work index. *Research in nursing & health*, 25(3), 176-188. <https://doi.org/10.1002/nur.10032>
- Moisoglou, I., Y., fantis, A., Galanis, P., Pispirigou, A., Chatzimargaritis, E., Theoxari, A., & Prezerakos, P. (2020). Nurses work environment and patients' quality of care. *International Journal of Caring Sciences*, 13.112-151, (1)
- Putri, E. S. K., Nuswantari, A. T., & Imam, C. W. (2018). Effect of perception of patient safety culture dimensions on the willingness to report patient safety incident. *Jurnal Aplikasi Manajemen*, 16.147-152, (1).
- Ricklin, M. E., Hess, F., & Hautz, W. E. (2019). Patient safety culture in a university hospital emergency department in Switzerland—a survey study. *GMS journal for medical education*, 36(2)
- Saqer, T. J., & AbuAlRub, R. F. (2018). Missed nursing care and its relationship with confidence in delegation among hospital nurses. *Journal of clinical nursing*, 27.2193-2117 (14-15)
- Sheykhsaran, E., Ebrahimzadeh Leylabadlo, H., Alinezhad, F., Feizi, H., & Bannazadeh Baghi, H. (2022). A New Insight into Nosocomial Infections: A Worldwide Crisis. *Journal of Medical Microbiology and Infectious Diseases*, 10(2), 64-74. <https://doi.org/10.52547/JoMMID.10.2.64>
- Smith, J. G., Morin, K. H., Wallace, L. E., & Lake, E. T. (2018). Association of the nurse work environment, collective efficacy, and missed care. *Western journal of nursing research*, 40(6), 779-798. <https://doi.org/10.1177/0193945917734159>
- Steven K. Thompson. (2012). Sampling, 3rd Ed., p.: 59-60
- Willis, E., & Brady, C. (2022). The impact of “missed nursing care” or “care not done” on adults in health care: A rapid review for the Consensus Development Project. *Nursing Open*, 9(2), 862-871. <https://doi.org/10.1002/nop2.942>
- Winsett, R. P., Rottet, K., Schmitt, A., Wathen, E., Wilson, D., & Group, M. N. C. C. (2016). Medical surgical nurses describe missed nursing care tasks—Evaluating our work environment. *Applied Nursing Research*, 32, 128-133. <https://doi.org/10.1016/j.apnr.2016.06.006>

Zeleníková, R., Jarošová, D., Plevová, I., & Janíková, E.
(2020). Nurses' Perceptions of Professional Practice
Environment and Its Relation to Missed Nursing
Care and Nurse Satisfaction. *International Journal of
Environmental Research and Public Health*, 17(11),
3805.