

Nurses' attitude toward patients' safety climate during COVID-19 pandemic: a cross-sectional study[†]



Original article

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Received: 22 March 2023; Accepted: 26 September 2023; Published: 20 March 2024

Abstract: **Objective:** Patient safety is a fundamental factor in improving the quality of care provided in hospitals. Therefore, it is considered a significant parameter by all healthcare organizations around the world. The present study was conducted to investigate the attitude of nurses toward the patient safety climate during the Coronavirus Disease 2019 (COVID-19) pandemic in the southeast of Iran.

Methods: This is a cross-sectional descriptive study. Among all the nurses working in one of the hospitals in the southeast of Iran, 171 nurses participated in the study through convenience sampling methods. The survey was conducted between June 1 and July 30, 2020. A 2-part questionnaire including demographic information and an assessment of nurses' attitudes toward patients' safety climate was used for data collection in 2021. The content validity of the scale is (0.77) and reliability was re-calculated and confirmed by the present study with Cronbach's alpha ($\alpha = 0.9$). Data were analyzed by SPSS 20 (IBM Corporation, Armonk, New York, United States) using descriptive and analytical statistical tests.

Results: The mean score of safety climates was 3.2 ± 5.20 (out of 5 scores). The results showed that among all dimensions of the safety climate, only the education dimension was statistically significant between males and females ($P < 0.001$). Also, there was a significant relationship between the overall average of the safety climate and its dimensions according to the people's position only in the dimension of supervisors' attitude ($P < 0.01$) and burnout ($P < 0.01$). Additionally, a significant correlation between the education level and the overall score of safety climate ($P < 0.01$), as well as the supervisor's attitude dimension ($P < 0.01$), was observed.

Conclusions: The results showed that the safety climate was at a relatively favorable level. Considering the impact of nurses' attitudes on the safety climate of patients, its improvement seems necessary. It is recommended to design training courses and educate nurses in order to promote a patients safety climate in hospitals.

Keywords: COVID-19 • Iran • nurses • patient safety climate

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1. Introduction

Improving patient safety is a global necessity.¹ Employees' understanding of the management, teamwork, work environment satisfaction, and workloads have significant impacts on the patient safety climate.² Patient safety reduced the unwanted complications of the therapeutic interventions by concentrating

[†]This study was supported by the Bam University of Medical Sciences, Bam, Iran.

How to cite this article: Nassehi A, Ghorbanzadeh K, Moayedi S, Jafari J, Mahmoodi P, Jafari M. Nurses' attitude toward patient safety climate during COVID-19 pandemic: a cross-sectional study. *Front Nurs.* 2024;1:39–46.

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on preventive strategies.³ Annually, millions of patients around the world suffer from disability, injury, or even death caused by unsafe medical care, while about 50% of these complications are preventable.⁴

Rapid changes in the healthcare system require more attention to patient safety, which is necessary to provide efficient and high-quality health care. Patient safety is identified as a condition resulting from the modification of human behaviors or the design of a physical environment to reduce risks of unwanted events in hospitals.⁵ Thus, improving patient safety is a significant component of reducing medical errors and unwanted complications which is the common responsibility of all healthcare professionals.⁶

Recently, the COVID-19 pandemic, as a global concern, has created many challenges in the field of patient safety, especially in vulnerable groups, such as elderly people.⁷ Fear experienced by the general public due to the COVID-19 pandemic is likely enhanced by social isolation measures including quarantines, stay-at-home regulations, travel restrictions, and nonessential business closures.⁸ Providing safe and high-quality care should always be a fundamental goal of any healthcare system in the world, even in times of crisis such as natural disasters, wars, or epidemics. In this way, the effects of COVID-19 on healthcare workers and patient safety should be further investigated. One of the ways to gain insight into the patient's safety situation is by evaluating the safety climate and reporting the incidents in hospitals.⁹ Active safety patient measures must continue even in pandemics. For this, we need various methods to evaluate and support patients' safety during their hospitalization.¹⁰

We need to measure the safety climate in different units that provide the same services because it may be different from the general climate of that health organization.² Since nurses are the main players in patient safety and are mainly responsible for reporting complications, it is very important to evaluate nurses' attitudes toward the safety climate. Identifying the strengths and weaknesses in the patient safety climate can help organizations in designing, implementing, and evaluating safety-related interventions.³

Safety climate plays a very important role in reducing safety-related events, such as medication errors. Also, it has been shown that rehospitalization is less reported in departments that have a more positive safety climate. It also improves the quality of nursing care.² Huang et al.'s¹¹ study suggested that hospital personnel with positive patient safety attitudes can help the organization reduce unwanted medical complications resulting from patient falls, medication errors, and employees' absenteeism. According to Rigobello et al.,¹² job satisfaction and management understanding had respectively the

greatest and the least impact on the safety climate in all studied professions. The safety climate may be evaluated as an indicator of the safety culture of medical-health centers' state and the individual's understanding of the attitude toward the organizational cultures.

Some studies evaluate the nurses' attitude toward patients' safety. However, rapid changes were observed in care delivery models during the COVID-19 pandemic, including increased workloads, working in an unfamiliar clinical setting, cancelation of routine services, and the need to treat patients with new diseases about which little is known. Working in these challenging conditions may affect the staff's ability to provide a safe and effective care. The COVID-19 pandemic has placed unprecedented demands on healthcare systems all around the world. Hence, conducting this study during the COVID-19 pandemic is an innovative than other studies. On the other hand, there has been no systematic evaluation of the impact of the COVID-19 pandemic on patient safety. Although, a positive safety climate is associated with improved patient safety and, in turn, favorable therapeutic outcomes and patients' satisfaction. This made authors enthusiastic to assess how COVID-19 and its related conditions change the attitude and performance of nurses toward patients' safety. This study was conducted to evaluate the effects of COVID-19 pandemic on the safety climate with the nurses in Southeast Iran.

2. Methods

2.1. Design

This is a cross-sectional descriptive study. Samples were selected from all nurses working in one of the hospitals in the southeast of Iran. All wards of this hospital was allocated to patients with COVID-19. Based on the Cochrane formula sample size were estimated as 171 nurses. Samples were selected through convenience sampling methods. Inclusion criteria included having at least 6 months' experiences as a nurse, having access to a mobile phone with an active WhatsApp or Telegram application in order to receive the electronic questionnaire. Exclusion criteria included willing to withdraw from, or leave, the study at any point without feeling an obligation to continue.

2.2. Questionnaire

A 2-part online questionnaire was designed and used for data collection. The first part of the questionnaire was used to collect demographic characteristics of participants and in the second part of the questionnaire, were questions related to the nurses' attitudes toward the patient's safety climate. This Questionnaire has 22

questions to evaluate 6 factors, including cumulative burnout (5 questions), educating nurses (5 questions), communication with physicians (3 questions), communication with nurses (3 questions), the attitude of supervisors (3 questions), and reporting errors and mistakes (3 questions). The answers to the questions were based on a 5-point Likert scale (number 1 for completely disagree, number 2 for disagree, number 3 for neither agree nor disagree, number 4 for agree, and number 5 for completely agree). Therefore, the score of each factor is in the range of 1–5. Considering that all the questions were positive, the higher scores on the safety climate are an indication of a better situation in terms of safety.

2.3. Data collection procedure

Based on the study of Sarsangi et al.¹³ which was conducted in Iran, the face, content validity (0.77), and construct validity of the questionnaire was calculated. The internal consistency and test-retest reliability method was used to evaluate the questionnaire reliability. Its reliability was confirmed based on Cronbach's alpha (0.79). Cronbach's alpha was re-calculated and confirmed in the present study ($\alpha = 0.9$).

2.4. Data analysis

A list of telephone numbers of nurses who have inclusion criteria and worked in COVID-19 wards was provided by the hospital manager. After describing the goals of the study and obtaining informed consent from nurses, a questionnaire was sent to 190 nurses' WhatsApp or telegram applications. Only 171 nurses filled out questionnaires and returned them to the researcher. The survey was conducted between June 1 and July 30, 2020. Data were analyzed using SPSS-20 software.

2.5. Ethics statement

This study was approved by the ethics committee of Bam University of Medical Sciences, Bam, Iran. Informed consent was obtained from the participants in the first section of the online questionnaire. Before being asked to sign an informed consent form, participants were given information regarding the study's goals, the voluntary nature of their involvement, confidentiality, and anonymity.

3. Results

A total of 171 nurses participated in this study. The majority of them were female and married. Demographic characteristics of the included nurses are presented in Table 1.

According to the results of Table 2, the average safety climate of nurses in the present study was 2.98 ± 0.6 with a range of (1–4.59). The lowest and highest averages were respectively related to cumulative burnout and reporting errors and mistakes (3.47 ± 0.9 – 2.54 ± 0.76).

Variables	Frequent	Percent
<i>Age (years)</i>		
20–25	25	14.6
26–30	46	26.9
31–36	41	24.0
37–45	46	26.9
46 and more	13	7.6
<i>Sex</i>		
Male	53	31.0
Female	118	69.0
<i>Marital status</i>		
Single	60	35.1
Married	111	64.9
<i>Education</i>		
Associate degree	13	7.6
Bachelor and above	158	63.2
<i>Shift work</i>		
Morning	54	31.4
Night	20	11.9
Morning and night	97	56.7
<i>Second job</i>		
Yes	22	12.9
No	149	87.1
<i>History of nursing errors</i>		
Yes	97	56.7
No	74	43.3
<i>Job position</i>		
Clinical nurse	138	80.7
Nursing manager	33	19.3

Table 1. Demographic characteristics of nurses.

Variable	Mean	S.D	Minimum	Maximum
Cumulative burnout	2.54	0.89	1	4.40
Educating nurses	2.90	0.84	1	5.00
Communicate with doctors	2.96	0.82	1	5.00
Communicate with nurses	3.41	0.82	1	5.00
Supervisors' attitude	2.94	0.85	1	5.00
Error reporting	3.47	0.71	1	5.00
safety climate	2.98	0.60	1	4.59

Table 2. Mean and standard deviation of safety climate and its dimensions in the included nurses.

Variable	Cumulative burnout	Education	Communicate with doctors	Communicate with nurses	Supervisors' attitude	Error reporting	Safety climate
<i>Sex</i>							
Male	2.79 ± 0.91	3.05 ± 0.61	2.94 ± 0.73	3.39 ± 0.86	2.88 ± 0.78	3.33 ± 0.62	3.04 ± 0.47
Female	2.43 ± 0.86	2.83 ± 0.92	2.97 ± 0.85	3.42 ± 0.81	2.96 ± 0.88	3.53 ± 0.75	2.95 ± 0.65
<i>Marital status</i>							
Single	2.45 ± 0.94	2.90 ± 0.89	2.87 ± 0.88	3.34 ± 0.91	2.91 ± 0.86	3.28 ± 0.81	2.91 ± 0.68
Married	2.59 ± 0.85	2.90 ± 0.81	3.01 ± 0.78	3.45 ± 0.78	2.95 ± 0.85	3.57 ± 0.64	3.02 ± 0.56
<i>Education</i>							
Associate degree	2.41 ± 1.05	2.80 ± 1.06	2.69 ± 1.04	3.20 ± 1.06	3.10 ± 1.20	3.10 ± 1.01	2.83 ± 0.93
Bachelor and more	2.55 ± 0.87	2.91 ± 0.82	2.98 ± 0.80	3.43 ± 0.80	2.90 ± 0.82	3.50 ± 0.68	2.99 ± 0.57
<i>Post</i>							
Clinical nurse	2.46 ± 0.92	2.88 ± 0.81	2.89 ± 0.80	3.41 ± 0.83	2.87 ± 0.87	3.43 ± 0.72	2.93 ± 0.61
Nursing manager	2.87 ± 0.65	2.95 ± 0.96	3.23 ± 0.83	3.41 ± 0.79	3.23 ± 0.70	3.63 ± 0.70	3.16 ± 0.55
<i>Second job</i>							
Yes	2.59 ± 0.96	2.58 ± 0.85	2.62 ± 0.74	3.22 ± 0.74	2.68 ± 0.96	3.46 ± 0.70	2.80 ± 0.61
No	2.54 ± 0.88	2.95 ± 0.83	3.01 ± 0.82	3.44 ± 0.83	2.98 ± 0.83	3.47 ± 0.72	3.0 ± 0.60
<i>History of nursing errors</i>							
Yes	2.58 ± 0.88	2.86 ± 0.76	2.91 ± 0.78	3.35 ± 0.77	2.85 ± 0.69	3.43 ± 0.67	2.95 ± 0.5
No	2.50 ± 0.89	2.94 ± 0.93	3.03 ± 0.86	3.49 ± 0.89	3.05 ± 1.01	3.52 ± 0.77	3.02 ± 0.71

Table 3. Mean and deviation of safety climate and its dimensions based on demographic characteristics.

Variable	Cumulative burnout	Educating nurses	Communicate with doctors	Communicate with nurses	Supervisors' attitude	Error reporting	Safety climate
Cumulative burnout	1						
Educating nurses	0.329	1					
Communicate with doctors	0.345	0.537	1				
Communicate with nurses	0.246	0.522	0.571	1			
Supervisors' attitude	0.333	0.541	0.558	0.511	1		
Error reporting	0.296	0.497	0.495	0.452	0.444	1	
Safety climate	0.659	0.806	0.763	0.710	0.743	0.678	1

Table 4. Correlation between safety climate dimensions.

Based on the results of Table 3, the overall average of the safety climate among men was higher than women, although this value was not statistically significant ($P = 0.06$). Among the dimensions of the safety climate, only the educating nurses' dimension between the 2 gender groups was statistically significant ($P > 0.001$) and there was no significant relationship between the overall average score of the safety climate and its dimensions in married and unmarried nurses with a second job. Only in the dimension of supervisor's attitude ($P > 0.01$) and burnout ($P > 0.001$) a significant relationship was observed. Based on the employment status, it was significant only in the education dimension ($P > 0.01$). Also, in terms of the

level of education, the overall score on safety climate ($P > 0.01$) and the supervisor's attitude had a significant relationship ($P > 0.01$). The results showed that no significant relationship was found between the average score of the safety climate in other demographic variables, including the history of nursing errors and the type of work shift.

The Pearson correlation coefficient results between the safety climate dimensions (Table 4) show that there is a statistically significant relationship between all the factors.

Table 5 demonstrates the mean and standard deviation of nurses' answers to the questions related to measuring their attitude toward patient safety climate.

Questions	Minimum	Maximum	Mean	SD
In general, I do not feel physically exhausted.	1	5	2.37	1.147
I don't feel mentally tired.	1	5	2.39	1.123
I have the necessary time to recover from fatigue even though I work in this hospital.	1	4	2.60	1.066
Although I work in this hospital, I have enough time to sleep.	1	5	2.67	1.127
If I make a mistake or an error, supervisor doesn't blame me before hearing what I say.	1	5	2.72	1.185
In our department, there is enough time to rest between work periods.	1	5	2.72	1.129
In this hospital, I can access the latest healthcare knowledge.	1	5	2.77	1.070
In this hospital, appropriate training is given to each nurse with regard to nursing skills needed.	1	5	2.84	0.986
Physicians do not give vague orders to nurses or the nursing team.	1	5	2.89	1.037
In this hospital, appropriate skills training is provided for new nurses.	1	5	2.91	1.011
If I make a mistake, the physician does not reprimand or blame me before hearing my explanations.	1	5	2.92	1.037
Supervisors provide appropriate instructions on nursing skills for me.	1	5	2.95	1.105
In this hospital, nurses receive on-the-job training to improve their nursing skills.	1	5	2.98	1.014
In this hospital, there are many educational opportunities to improve the abilities of nurses.	1	5	3.02	1.098
Information about errors and mistakes that may happen is shared between nurses and physicians.	1	5	3.08	0.997
There is a good climate among nurses to proactively prevent errors.	1	5	3.09	1.036
When nurses propose measures for the safety of patients, the supervisor shares them with me.	1	5	3.16	1.014
The results of reporting errors and mistakes are reflected in the workplace.	1	5	3.34	0.977
When someone makes a mistake, the nurses discuss and exchange opinions with each other about ways to improve the situation.	1	5	3.43	1.090
Reports of errors and mistakes have increased the awareness of nurses on patient safety.	1	5	3.53	0.890
Reports of errors and mistakes are related to safety training.	1	5	3.56	0.848
Nurses help each other.	1	5	3.73	0.927

Table 5. Mean and standard deviation of answers to the questions related to measuring nurses' attitude toward patient safety climate.

4. Discussion

Safety is a fundamental element of providing effective and high-quality care to patients. A safe climate prepares healthcare organizations to identify work problems and high-risk situations.¹⁴ In the current study, which was conducted to investigate the attitude of nurses toward the patient's safety climate during the COVID-19 pandemic, the mean score of the safety climate was relatively favorable (moderate), which was in line with the findings of Yarmohammadi¹⁵ and Sarsangi¹³. It indicates that despite the special conditions during the COVID-19 pandemic, the attitude of nurses has not changed, which may be a positive point.

A high safety climate may result in more understanding and work commitment as well as creating a safe environment to report errors and mistakes. It should be noted that nurses play a very important role in improving

the safety climate.^{16,17} In the present study, similar to other studies, the mean score of reporting errors and mistakes was higher than other variables, and it seems that with greater interaction of managers, on-the-job training, and professional commitment, nurses are more inclined to report errors and mistakes.^{13,15}

Kim et al.¹⁸ also showed that internal and external factors such as nurses' awareness, maintaining personal and professional reputation, sense of security, empathy, and managerial support are effective factors in reporting errors and mistakes and thus improving the safety climate. Also, Ghasemi et al.¹⁹ reported errors and mistakes, nurses' training, and supervisor's attitude as effective factors in safety participation. Among the effective factors in preventing errors and undesired conditions is the recognition of issues related to the nursing work environment and safety climate, which may reduce possible harm to the patients.²

Notably, a direct relationship exists between work environment problems and burnout.²⁰ In our study, the total burnout score was less than other safety climate dimensions, which is consistent with the results of Yarmohammadi¹⁵ and Ghiyasi.²¹ Monitoring systems should not only examine patients (complications and mortality) but also employees (job satisfaction and burnout), work environment (welfare, number of employees, educating of employees, working hours and amount check the admission and discharge of patients).²²

A high safety climate reduces burnout and job-related injuries, which can be achieved by taking into consideration the specific measures related to safety climates such as careful monitoring, timely provision of support and solutions, and nurses' support in reporting and responding to errors and mistakes.

A safe climate provides an environment for nurses to learn and feel safe. Quality patient care requires enhancing job satisfaction, management leadership skills, and teamwork. Currently, the working conditions of nurses and the safety climate need improvement in most health organizations. Building a learning and nonpunitive work environment and developing effective communications among health staff as well as on-the-job training programs and pairing experienced nurses with less experienced ones are factors that should be considered in the plans of managers for creating a safe climate.^{23,24}

By improving the leadership skills of managers and their commitment to safety as well as holding meetings to share experiences and provide feedback, creating a culture of learning from errors and mistakes, using measures to remove organizational obstacles, and increasing the awareness of nurses, the safety climate can be improved.²⁵ However, improving the safety climate sometimes does not require large investments; with some changes in the behavior of the management and care teams, the safety climate can be easily improved. When health workers, including nurses, are equipped with the knowledge of safety attitudes, a safe and high-quality nursing care can be provided to patients by health organizations.²⁶

In our study, male supervisors with master's degrees and stable employment status paid more attention to the safety climate. It seems that experienced nurses in higher and secured positions have a greater desire to comply with safety and share related knowledge and

experiences. Cooperation among staff in a safe climate can lead to greater effectiveness in organizations.^{23,27} More future research on the effects of gender on the safety climate and its related factors seems necessary.

5. Conclusion

In the present study, the score of nurses' safety climate was average. Since the safety climate is one of the important factors in improving the quality of patient care, nursing managers should pay more attention to its related factors, such as job burnout and continuous training of employees and supervisors, communication skills, and creating a safe and nonpunitive climate for reporting errors and mistakes.

Limitations

The small sample size, localization of the study, and the exclusion of some samples for not answering all questions in the questionnaire were the limitations of the current research. Therefore, it is recommended to conduct research with a larger sample size in a wider geographical area.

Acknowledgment

The researchers would like to express their gratitude to the nurses who participated in the present study and to the Research Vice-Chancellor of Bam University of Medical Sciences for supporting the project.

Availability of data and materials

The datasets analyzed during the current study are available from the corresponding author upon reasonable request.

Ethical approval

This study was approved by the ethics committee of Bam University of Medical Sciences, Bam, Iran.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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