

## Assessment of Patient safety culture among Operating Room staff at Educational centers in Mazandaran University of Medical Sciences

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### Abstract

**Background and Objective:** The safety culture of the patient is one of the main components of the services. Creating an effective culture of patient safety prevents many accidents and helps the organization to improve services. Therefore, it is necessary to assess the patient's safety culture. The present study aimed to evaluate the current status of Patient safety culture in operating room staff of educational centers in Mazandaran University of Medical Sciences.

**Methods:** The present cross-sectional and analytical descriptive type study was performed in hospitals of Mazandaran University of Medical Sciences. 136 employees of operation room were selected through stratified random sampling. The data collection tool was a two-part questionnaire including demographic information and the standard questionnaire including 42 questions of Hospital Survey on Patient Safety Culture (HSOPS).

Answers of the questions were designed on a 5-point Likert scale. Data were analyzed by Mann-Whitney and Kruskal-Wallis statistical tests using SPSS software version 16.

**Results:** The results of this study show that the highest mean scores between the two dimensions of overall perception of patient safety and non-punitive response in case of an error were  $15.16 \pm 2.71$  and  $14.96 \pm 2.90$ , respectively and the lowest mean score for teamwork between units and the staffing issues of employee were  $8.32 \pm 1.98$ , and  $8.82 \pm 1.53$  respectively. The overall safety culture of the patient was not significantly related to gender, education, and marital status. However, a positive relationship was observed between the work history and the patient's general culture score.

**Conclusion:** By measuring the safety culture of health care organizations, we can identify the strengths and weaknesses of these organizations in terms of patient safety and plan for proper safety development in the hospital. Based on the results of the present study, providing sufficient personnel and job standards for personnel and allocating sufficient resources to improve the quality and care and improving team work between units by managers may help to promote the safety culture in health care centers.

Along with the main mission of hospitals which is providing the effective and safe services, concentration on patient safety culture should be as a priority in management plans to provide a basis for enhancing patient safety

**Keywords:** Patient Safety Culture, HSOPSC, operating room nursing

### Background and Objective

Following the report of the American Medical Association, "Human is in error, patient safety has become a concern in health care organizations<sup>1</sup>. that has presented the prevalence of medical errors in the United State<sup>2,3</sup>. Research efforts in different countries have focused on the evaluation of safety culture<sup>4-7</sup>. It is believed that Safety problems are caused by safety violations and unintentional errors and mistakes. Studies show that the majority of errors and adverse events more accurately stem from a complex chain of events that jointly contribute to the cause rather than human errors<sup>8</sup>. Studies show that most errors and adverse events more accurately stem from a complex chain of events that jointly contribute to the cause rather than human errors<sup>7</sup>. In recent years, patient safety is one of the main criteria for the quality of health care<sup>9</sup>. The patient's safety means preventing any injury and wound to the patient during the care and treatment provision<sup>10</sup>. These risks include the complications and medication errors, complications of operations and aggressive therapies such as surgery, misdiagnosis and equipment failure, and the use of inadequate medical equipment, hospital infections, falling, bed sores, etc<sup>11</sup>.

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Therefore, studies have shown that in 3% to 5% of patients with iatrogenesis infections, 5.6% to 17% had undesirable drug side effects, more than 8% of complications due to medical equipment and 0.95% of cases were due to drugs side effects<sup>12</sup>.

A significant number of patients are exposed to adverse events and damages related to medical error during attendance in health care systems; Especially in hospitals, so their problems get worse<sup>13</sup>.

Every year, in the United States, 98,000 people die because of preventable medical errors<sup>14</sup>. During the past 2 decades, it has been globally thought that health systems are not safe adequately and should be promoted. So, the safety culture is one of the effective factors in improving the patient's safety level in health and educational Centers<sup>15</sup>.

The World Health Organization (WHO) recommends extensive attempts to decrease the frequency of adverse events, detection of their causes, and improvement of them<sup>16</sup>.

Patient safety in advanced and developing countries is also defined as preventing and minimizing adverse outcomes and injuries when providing care services<sup>1</sup>. Today, in many countries and communities, efforts are being made to evaluate the safety culture in organizations. Knowledge about patient safety culture becomes increasingly more important, as health care organizations try to improve the quality of health care<sup>2</sup>.

Studying patient safety culture can provide important feedback on health care systems for implementing improvement programs based on the recognition of some problems<sup>17</sup>. If measurements of patient safety culture and improvement process are performed adequately, they can act as ceiling point for submission of patient safety at a high level<sup>18</sup>. Researchers have identified four factors from the literature that characterize a safety culture: Donaldson et al recognition of the risk of error in the organization's activities<sup>1</sup>, Chen and li blame-free environment for reporting<sup>2</sup>, Fleming and Wentzell collaboration across the organization and Sochalski<sup>4</sup> organizational resources for safety<sup>19</sup>. An overall safety climate that encompasses the development of effective safety practices and encourages adherence to these practices as

well as continuous learning from errors provides that basis for safer performance<sup>6</sup>.

Patient safety is an important part of clinical governance which has been recently focused by Iranian health care centers. In Iran, in response to the increasing medical errors and public opinion on this issue, the Ministry of Health and Medical Education has placed patient safety issues in the top priority of its programs, but the lack of research is evident in this area, so further research is needed to better understand the medical errors in order to provide Safer services<sup>14</sup>. Also, studies in Iran indicate that the patient's safety atmosphere is not in a suitable and acceptable condition in the studied centers<sup>20,21</sup>. The most important reasons for improving the level of patient safety are the viewpoints and performance of the medical care services staff. In 2012, the United States reported that the positive perception of the medical staff about the patient's safety culture would lead to better patient care<sup>2,22</sup> and this is some self-service providers who play an important role in improving the patient's safety<sup>23,24</sup>.

Patient is the costumer of the health system and his/her safety is an important issue. His/her ignorance might impact the efficacy of health care system.

Therefore, the aim of this research is determining the status of patient safety culture among operating room staff of Mazandaran educational centers.

## Methods

The present study is a cross-sectional study that was carried out during March 2018 to September 2018 in educational centers of Mazandaran University of Medical Sciences with the aim of determining the status of the patient's safety culture in the operation room.

The sample size was estimated 136 people by considering the total number of operation rooms, nurses and anesthesiologists working in educational centers and using Cochran's formula. Participants in this study were nurses working in educational centers of Mazandaran University of Medical Sciences, including operation room technologists and anesthetists who had at least six months of work

experience and were willing to participate in the study.

The sampling method was used to select the participants. Five educational hospitals (Imam Khomeini, Bu-Ali Sina, Burns hospital of Zare, Hazrat Fatemeh and Razi) participated randomly using the personnel list in operation room. In order to collect the information in this study, a questionnaire of personal characteristics and a questionnaire of patient safety culture (Hospital Survey on Patient Safety Culture), a demographic questionnaire including questions for evaluating some variables including age, gender, field and academic degree, occupation, Type of employment, work experience in the hospital, work experience in the recent unit, hours of work per week were used. This questionnaire has 42 questions that measure employee perception in 12 dimensions of patient safety culture.

These dimensions include: General understanding of patient safety, employee perceptions of error reporting and non-punitive responses to mistakes, employee perceptions of direct managers' activities related to promoting safety at work units and in hospitals, employee perceptions of relevant information Improving the quality of the organization, understanding employees from the level of team work within the unit and at the hospital level, understanding employees from open communication in the work unit and in the hospital, employees' understanding from contact and error, employees perception from the proportion of the number of nurses and workload, employee perceptions of how to transfer a patient from one unit to another unit. These dimensions also include two questions, one about how many respondents consider the patient's safety and how many reports had errors during the last 12 months.

The 5 point Likert-type scale, was used in this questionnaire to obtain the views of respondents. The score of the patient safety culture is between 42 and 210. In this study, the qualitative classification of the patient's safety score was also performed, so that scores equal to or greater than 50% of the total (scores of 105 and above) are considered as "desirable safety culture" and scores of less than 50 percent (scores of 104 and below)

were considered as "undesirable safety culture". The Persian version of this questionnaire was validated in Iran and its reliability was confirmed by 0.86 (Article 15 of the methodology).

In information gathering stage, after selecting the participants using the sampling method, they were invited to participate in the study. If they were willing to participate in the study, written and informed consent form was completed by them, then a questionnaire of personal data and patient safety questionnaire was provided to them.

The questionnaires were completed in the presence of the interviewers and, if there was any ambiguity or question, they would receive appropriate answers. After studying the data, the validity of the questionnaires was analyzed using SPSS software version 16. Descriptive statistics and frequency distribution indicators were used to report individual and occupational characteristics of the participants and the status of the safety culture in different areas.

One-way analysis of variance and Spearman Brown's correlation test were used to examine the relationship between safety culture and some variables. Also,  $p < 0.05$  was considered statistically significant.

## Results

In this study, 136 samples from 5 educational centers of Mazandaran University of Medical Sciences participated. The highest number of participants in the study was from Imam Khomeini Hospital with 27.2% of total participants. Investigating the participants in this study showed that the mean and standard deviation of their age was  $32.33 \pm 7.10$  years, of which 58.8% (80) were female and 1 person (0.7%) did not respond to question related to the gender.

Regarding the marital status of the samples, the results showed that 62.5% of all participants (85 persons) were married and most of the participants' occupation frequency with a frequency percentage of 64% (87) was related to operation room nurses and 63.2% of all samples had a bachelor of science degree and 25.7% of the samples (35 people) had a work experience of up to 5 years and 7.3%

(10 people) had a work experience of more than 21 years.

Participants' review of the patient safety culture showed that the mean and standard deviation of the overall patient safety culture score was  $128.92 \pm 11.97$ , and the highest score in the overall understanding of patient safety was  $15.16 \pm 2.71$  and the lowest score of  $8.32 \pm 1.98$  was related to the teamwork between units.

The examination of the patient's safety status in terms of the hospitals also showed that Imam Khomeini's educational center had the highest score of  $131.51 \pm 11.31$  and Bu-Ali Sina's educational center with  $129.03 \pm 12.55$  have obtained the lowest score in the patient safety culture. The patient safety culture according to the classification of educational centers is presented in Table 1.

**Table 1:** The mean dimensions of safety culture from the viewpoint of the operation and anesthetic room staff of educational centers in Mazandaran University of Medical Sciences.

	Imam Khomeini Hospital	Bu ali	Razi	Fatemeh Zahra	Zare	General mode
	Mean $\pm$ standard deviation	Mean $\pm$ standard deviation	Mean $\pm$ standard deviation	Mean $\pm$ standard deviation	Mean $\pm$ standard deviation	Mean $\pm$ standard deviation
Teamwork within the units	$9.18 \pm 1.86$	$9.65 \pm 2.13$	$9.5 \pm 1.90$	$9.86 \pm 2.18$	$9.55 \pm 2.13$	$9.53 \pm 2.01$
Expectations and actions of unit supervisor for patient safety	$12.54 \pm 2.03$	$12.09 \pm 1.94$	$12.33 \pm 1.92$	$11.91 \pm 2.13$	$11.90 \pm 2.04$	$12.19 \pm 1.99$
Management support of patient safety	$10.91 \pm 1.70$	$10.71 \pm 1.97$	$10.41 \pm 1.83$	$11.30 \pm 1.29$	$10.50 \pm 2.11$	$10.78 \pm 1.79$
Organizational learning of continuous improvement	$10.75 \pm 2.40$	$9.40 \pm 2.74$	$11.00 \pm 1.30$	$10.26 \pm 3.06$	$10.85 \pm 2.51$	$10.38 \pm 2.65$
A general understanding of patient safety	$15.32 \pm 2.74$	$14.93 \pm 3.01$	$14.75 \pm 2.47$	$15.26 \pm 2.83$	$15.65 \pm 2.43$	$15.16 \pm 2.71$
Communicate and provide feedback on errors	$10.91 \pm 2.43$	$10.81 \pm 2.71$	$10.83 \pm 2.14$	$10.91 \pm 2.55$	$10.80 \pm 2.30$	$10.86 \pm 2.42$
Openness of communication channels	$9.56 \pm 1.21$	$9.46 \pm 1.26$	$9.20 \pm 1.53$	$9.34 \pm 1.30$	$9.40 \pm 1.42$	$9.48 \pm 1.40$
Frequency of reporting and events	$10.64 \pm 2.18$	$10.53 \pm 2.01$	$9.79 \pm 2.06$	$10.30 \pm 2.34$	$10.80 \pm 2.16$	$10.34 \pm 2.14$
Teamwork between units	$8.21 \pm 1.87$	$8.93 \pm 1.64$	$7.91 \pm 2.44$	$8.21 \pm 2.19$	$8.15 \pm 1.81$	$8.32 \pm 1.98$
Work related issues for employees	$8.75 \pm 1.85$	$8.75 \pm 1.58$	$8.75 \pm 1.29$	$8.91 \pm 1.59$	$9.05 \pm 1.66$	$8.82 \pm 1.53$
Delivery and evolution in the hospital	$9.51 \pm 1.40$	$9.15 \pm 1.60$	$9.08 \pm 1.17$	$9.34 \pm 1.56$	$9.25 \pm 1.25$	$9.41 \pm 1.57$
Non-punitive response in cases of error	$15.16 \pm 3.14$	$14.56 \pm 2.88$	$15.45 \pm 3.23$	$14.64 \pm 3.05$	$15.00 \pm 1.83$	$14.96 \pm 2.90$
Overall impression	$131.51 \pm 11.31$	$129.03 \pm 12.55$	$129.12 \pm 12.27$	$130.39 \pm 11.29$	$130.90 \pm 12.26$	$128.92 \pm 11.97$

The results of the study showed that the overall level of patient safety culture was not significantly correlated with the gender ( $p = 0.375$ ). The results of the Mann-Whitney test showed that in the 12 dimensions of safety culture, including teamwork between units,

and the other fields, there was no significant relationship ( $p > 0.05$ ). Chi-square test showed that there was no significant relationship between the units in terms of teamwork ( $p = 0.02$ ) and there was no significant relationship in other areas ( $p > 0.05$ ). There was no significant relationship between the overall

safety culture and the type of education ( $p = 0.381$ ). But Kruskal Wallis showed that there was a significant relationship between organizational learning and continuous improvement ( $p = 0.046$ ), and there was a higher score in associate's degree than in the bachelor's degree. But in other areas there was no significant relationship.

There is no significant relationship between overall safety culture and the marital status. But there is a significant relationship between delivery and evolution in the hospital with marital status ( $p = 0.005$ ), which has a higher score in married than single women, but there is no significant relationship between other areas. Spearman correlation coefficient showed that there is a positive correlation between work experience and total patient's overall culture with a correlation coefficient of 0.133 and a significant level of 0.03.

## Conclusion

One of the most valid and reliable tools for measure patient safety culture it precisely and appropriately is HSOPS. The first step in creating a safety culture in health service providers is to examine and evaluate existing culture using appropriate methods<sup>25</sup>. Many countries are trying to improve the patient's safety. They encourage their health care workers to evaluate their present safety culture and recover it<sup>2</sup>. Concerning the dimensions of patient safety culture, the present study showed that in the 12 dimensions of patient safety culture, the highest average of scores relate to a general understanding of patient safety, non-punitive response in cases of errors, and the lowest mean of scores is related to teamwork between units and work-related staff issues.

Moreover, since the units included in this study voluntarily offered to complete the HSOPSC, we suppose that their staff were likely to be more open and pro-positive in regard to most patient safety matters than staff in a differently selected sample.

Most of the study participants were nurses, like other related studies<sup>26</sup>. Nurses play a key role in improvement of patient safety culture<sup>27</sup>. Understanding and safety of their

attitudes is an important part of the patient safety culture<sup>28</sup>.

A study by Lawati et al. in Oman, the work-related issues obtained the lowest score, that could be due to a shortage of human resources and an increase in the incidence of errors and patient safety, which is similar to the results of this study<sup>29</sup>. In a study by Joffe regarding the fatigue of emergency personnel in the United States, it became clear that one of the strategies to prevent medical errors is to reduce fatigue, and emergency department managers should consider specific planning strategies to reduce it<sup>30</sup>.

In order to implement loving patient safety programs, error reporting and learning from it can be very helpful. However, according to this study and survey on other studies, there is still no culture required for reporting errors in hospitals. The audit of the causes of failure to report errors and removing existing barriers may improve the reporting process of errors with taking an effective step in promoting immunity.

In a similar study by Tereanu, et al., on the status of patient safety culture in Romania, the non-punitive response to errors was reported as one of the lowest-average dimensions<sup>31</sup>. Non-punitive response to error is one of the dimensions that may contribute to the creation of a patient safety culture, since in the context of patient safety culture, an organization will be succeeded that accepts the high risk of health care services and conditions and provide the conditions for individuals to report instances of error or close to error, freely and without fear of the punishment.

In this regard, all orders of the organization are expected to assist in finding the solution<sup>32</sup>. Therefore, the American Medical Association has advised that organizations for improvement in this field, should put aside this culture that suggest all errors and mistakes are caused by personal and individual deficiencies. Also, they should consider the mistakes as learning opportunities<sup>33</sup>.

Interestingly, teamwork within the units obtained high scores in many HSOPC studies conducted in China<sup>2,34</sup>. However in a study by

Desmedt et al. in a Community-Based Primary Care Setting, handover and teamwork between units were assessed as the lowest score<sup>35</sup>. Also, in the study of Abdi et al., Teamwork between units and non-punitive responses to errors have the lowest scores that in the first case were in agreement with the current study<sup>36</sup>.

In the study of Damayanti et al., The teamwork dimension between hospital units and management support, obtained the highest score and the non-punitive response to errors had the lowest score<sup>37</sup>. Also, in the study of Motazed et al., The work team at the hospital units received the highest score and the change in the hospital in the lowest score<sup>38</sup>. In the study of Mostafaei et al., The team work at the hospital units and the subsequent reporting of incident events among the dimensions of the safety culture, they have the highest score. While overall understanding of patient safety and non-responsiveness to errors was the lowest score among different dimensions of patient safety culture<sup>39</sup>, which are not consistent with the results of this study.

Based on the results of Rajalatchumi et al., Among the 12 dimensions of patient safety, two dimensions of teamwork within the unit and organizational learning and continuous improvement as safety culture strengths in a Tertiary Care Hospital, which are consistent with the results of this study<sup>40</sup>.

By examining demographic variables in this study, work history was described as one of the influential variables on the patient's safety culture and there was a significant positive relationship between the history and safety culture of the patient, which could be due to more experience in safety and patient safety culture. The study by Salarwand et al. In Khorramabad city<sup>41</sup> and Lee HH et al in Korea<sup>42</sup> also confirm that there is a meaningful relationship between the work record and the patient safety culture.

While Mallouli M et al did not find any meaningful relationship between the safety culture of a patient with a job record<sup>43</sup>, these differences can be attributed to the fact that the employee's understanding of the safety culture increases with increasing work experience, or young people More

scientifically and precisely, more dynamic. Of course, raising employees' perceptions of patient safety culture seems more logical by increasing their work history.

In the present study, there was no significant relationship between the relationship between the majority of demographic factors and the safety culture of the patient that was consistent with the study of Almasi et al<sup>44</sup>.

In this study, the difference between the mean dimensions of the patient's safety culture on the basis of sex showed that this difference was not significant for any of the dimensions. In Pourshareiati and Amrollahi Study on the status of patient safety culture among nurses of Shahid Rahnemoon Hospital of Yazd indicate that there is a significant relationship between work experience and gender with patient safety culture<sup>45</sup>, which was studied only in the first case. The present is in line.

The results of this study showed that there is no significant relationship between the overall culture of safety and the type of education. The study of Rabiei et al., Which was conducted to examine the demographic factors and the extent of the patient's safety culture in the health care staff, showed that the variables of gender, marital status and education did not have a significant relationship with the patient's safety culture<sup>46</sup>, which was consistent with the results of this study. In our sample, we did not have the power to elaborate this further; however, further research might examine more in detail whether advanced education, and the duration of training in itself, might play a role for patient safety.

However, in the present study, there is a significant relationship between delivery and evolution in a hospital with a marital status, which has a higher score in married than single ones.

The patient safety culture is one of the factors that can play a role in improving the patient's level of safety in hospitals. Hence, conducting research into identifying the factors associated with the patient's safety culture can be effective in strengthening the patient's safety culture and improving patient safety.

The assessment of safety culture, perceptions of safety in the organization, and the attitude

of managers and staff towards the safety issue. Also, the designation of a patient safety culture is a diagnostic tool for identifying the areas that need improvement in the organization. . The dependability (truth value in relation to data) of our results is high because the entire team contributed to the analysis and interpretation of data. The usefulness or transferability of our results depends on how well we have been able to capture the perceptions of participants. One possible limitation is that participants can be influenced by the presence of other people which can lead them to formulate answers which are more desirable and socially accepted. The problem of access to a number of personnel and their lack of cooperation due to the high level of employment was one of the limitations of this study. It is possible that the view of the staff who filled out the questionnaire, with the view of employees who did not wish to cooperate, the patient is different. However, this research was conducted with the aim of determining the status of the patient safety culture in the operation room of Mazandaran educational centers. The results were given to hospitals managers separately from each hospital. It is true that hospitals are aware of the strengths and weaknesses in the context of a safety culture, they can be better off in promoting safe crops The next steps are to examine the progress of the hospitals in promoting the safety culture.

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### Competing Interests

The authors declare no competing interests.

### Authors' Contributions

The authors contributed equally to the writing of the article

## References

1. Donaldson MS, Corrigan JM, Kohn LT. To err is human: building a safer health system: National Academies Press; 2000.
2. Chen I-C, Li H-H. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC). *BMC health services research*. 2010;10(1):152.
3. Fleming M, Wentzell N. Patient safety culture improvement tool: development and guidelines for use. *Healthc Q*. 2008;11(3):10-5.
4. Sochalski J. Quality of care, nurse staffing, and patient outcomes. *Policy, Politics, & Nursing Practice*. 2001;2(1):9-18.
5. Wakefield BJ, Blegen MA, Uden-Holman T, Vaughn T, Chrischilles E, Wakefield DS. Organizational culture, continuous quality improvement, and medication administration error reporting. *American Journal of Medical Quality*. 2001;16(4):128-34.
6. Hofmann DA, Mark B. An investigation of the relationship between safety climate and medication errors as well as other nurse and patient outcomes. *Personnel Psychology*. 2006;59(4):847-69.
7. Barry R, Murcko A, Brubaker C. The six sigma book for healthcare: improving outcomes by reducing errors: Health Administration Press; 2002.
8. Gershon RR, Karkashian CD, Grosch JW, Murphy LR, Escamilla-Cejudo A, Flanagan PA, et al. Hospital safety climate and its relationship with safe work practices and workplace exposure incidents. *American journal of infection control*. 2000;28(3):211-21.
9. Nash DB, Goldfarb NI. The quality solution: the stakeholder's guide to improving health care: Jones & Bartlett Learning; 2006.
10. Yaghobi Fma, Takbiri A, Haghgoshaye E, Tabarraye y. the survey of patient safety culture and recognizing its weaknesses and strengths in Sabzevar hospitals: 2011. 2013.
11. Abdi z, Maleki MR, Khosravi A. Perceptions of patient safety culture among staff of selected hospitals affiliated to Tehran University of Medical Sciences. 2011.

12. Schrappe M. Patient safety and risk management. *Medizinische Klinik (Munich, Germany)*. 1983;100(8):478-85.
13. Arab M, Hosseini M. Inpatient perceptions of participating in cure decision making and safety among public hospitals of Tehran Medical Sciences University. *Journal of Hospital*. 2012;11(1):29-38.
14. Al-Ahmadi TA. Measuring Patient Safety Culture in Riyadh's Hospitals: A Comparison between Public and Private Hospitals. *The Journal of the Egyptian Public Health Association*. 2009;84(5-6):479-500.
15. Anderson DJ. Creating a culture of safety: Leadership, teams, and tools. *Nurse Leader*. 2006;4(5):38-41.
16. Goodman GR. A fragmented patient safety concept: the structure and culture of safety management in healthcare. *Hospital topics*. 2003;81(2):22-9.
17. Fajardo-Dolci G, Rodríguez-Suárez J, Arbolea-Casanova H, Rojano-Fernández C, Hernández-Torres F, Santacruz-Varela J. Patient safety culture in healthcare professionals. *Cirugia y cirujanos*. 2010;78(6):527-32.
18. Fleming M. Patient safety culture measurement and improvement: a "how to" guide. *Healthc Q*. 2005;8(Spec No):14-9.
19. Reason J. Swiss cheese model. *Managing the risks of organizational accidents*. 2000.
20. Alahmadi H. Assessment of patient safety culture in Saudi Arabian hospitals. *Qual Saf Health Care*. 2010;19(5):e17-e.
21. Sorra J, Khanna K, Dyer N, Mardon R, Famolaro T. Exploring relationships between patient safety culture and patients' assessments of hospital care. *Journal of patient safety*. 2012;8(3):131-9.
22. Mardon RE, Khanna K, Sorra J, Dyer N, Famolaro T. Exploring relationships between hospital patient safety culture and adverse events. *Journal of patient safety*. 2010;6(4):226-32.
23. Shahri S, Kebriaee A, Seyedi H, Sarafraz Z. Patient safety climate in medical centers of Kashan. *Journal of Health Promotion Management*. 2012;1(1):62-72.
24. Rezapoor A, Tanoomand Khoushehmehar A, Bayat R, Arabloo J, Rezapoor Z. Study of patients' safety culture in Selected Training hospitals affiliated with Tehran university of medical sciences. *Journal of Hospital*. 2012;11(2):55-64.
25. Aseffa A, Chukwu JN, Vahedi M, Aguwa EN, Bedru A, Mebrahtu T, et al. Efficacy and safety of 'fixed dose' versus 'loose' drug regimens for treatment of pulmonary tuberculosis in two high TB-burden African countries: a randomized controlled trial. *PloS one*. 2016;11(6):e0157434.
26. Aiken LH, Sermeus W, Van den Heede K, Sloane DM, Busse R, McKee M, et al. Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. *Bmj*. 2012;344:e1717.
27. Izadi AR, Drikvand J, Ebrazeah A. The patient safety culture in Fatemeh Zahra hospital of Najafabad, Iran. 2013.
28. Moody RF. Safety culture on hospital nursing units: Human performance and organizational system factors that make a difference: ProQuest Information & Learning; 2007.
29. Lawati MHA, Short SD, Abdulhadi NN, Panchatcharam SM, Dennis S. Assessment of patient safety culture in primary health care in Muscat, Oman: a questionnaire-based survey. *BMC family practice*. 2019;20(1):50.
30. Joffe MD. Emergency department provider fatigue and shift concerns. *Clinical Pediatric Emergency Medicine*. 2006;7(4):248-54.
31. Tereanu C, Smith SA, Ghelase MS, Sampietro G, Molnar A, Dragoescu A, et al. Psychometric Properties of the Romanian Version of the Hospital Survey on Patient Safety Culture (HSOPS). *Maedica*. 2018;13(1):34.
32. Poley MJ, van der Starre C, van den Bos A, van Dijk M, Tibboel D. Patient safety culture in a Dutch pediatric surgical intensive care unit: an evaluation using the Safety Attitudes Questionnaire. *Pediatric critical care medicine*. 2011;12(6):e310-e6.
33. Baghaei R, Pirnejad H, Khalkhali H, Nourani D. Evaluating patient safety culture in personnel of academic hospitals in Urmia university of medical sciences in 2011. *The*



Journal of Urmia Nursing and Midwifery Faculty. 2012;10(2):155-64.

34. Liu C, Liu W, Wang Y, Zhang Z, Wang P. Patient safety culture in China: a case study in an outpatient setting in Beijing. *BMJ Qual Saf*. 2014;23(7):556-64.

35. Desmedt M, Bergs J, Willaert B, Schrooten W, Vlayen A, Hellings J, et al. Exploring and Evaluating Patient Safety Culture in a Community-Based Primary Care Setting. *Journal of patient safety*. 2018.

36. Abdi J, Maleki M, Khosravi A. Staff perceptions of patient safety culture in selected hospitals of Tehran University of Medical Sciences. *Payesh*. 2011;10(4):411-9.

37. Damayanti RA, Bachtiar A, editors. Outcome of patient safety culture using the hospital survey on patient safety culture (hsopsc) in asia: A systematic review with meta analysis. *Proceedings of the International Conference on Applied Science and Health*; 2019.

38. Motazedi Z, Beilankohi EM, Taherinia J, Asghari E, Bostanabad MA, Alikhah H. Assessment of patient safety culture from viewpoint of nurses working in Tabriz Sina educational and treatment center. *Majallah-i pizishki-i Danishgah-i Ulum-i Pizishki va Khadamat-i Bihdashti-i Darmani-i Tabriz*. 2019;41(1):92-9.

39. Mostafaei D, Aryankhesal A, Dastoorpoor M, Rahimikhalifekandi Z, Estebarsari F. Patient Safety Culture Assessment of Clinical and Paraclinical Staff Perspective in Selected University of Medical Sciences Hospitals in Tehran. *Iranian Journal of Health Education and Health Promotion*. 2018;6(3):293-301.

40. Rajalatchumi A, Ravikumar TS, Muruganandham K, Thulasingam M, Selvaraj K, Reddy MM, et al. Perception of patient safety culture among health-care providers in a Tertiary Care Hospital, South India. *Journal of natural science, biology, and medicine*. 2018;9(1):14.

41. Assessing medical staff's view of patient safety culture. *Quarterly Journal of Nersing Management*. 2016;4(3):54-64.

42. Lee H, Doh S, Hwang I. Patient safety culture measure in Korea. Seoul: Korea Institute for Healthcare Accreditation. 2017.

43. Mallouli M, Aouicha W, Tlili MA, Dhiab MB. Patient Safety Culture in Tunisia: Defining Challenges and Opportunities. *Vignettes in Patient Safety-Volume 3: IntechOpen*; 2018.

44. Almasi A, Pourmirza KR, Ahmadi JT, Godarzi A, Ahmadi A. Evaluation of patient safety culture in personnel of hospitals in Kermanshah, 2013. 2015.

45. Pourshareiati F, Amrollahi M. Patient Safety Culture from Rahnemon Hospital Nurses' Perspective. *Occupational Hygiene and Health Promotion Journal*. 2017;1(1):52-61.

46. Rabiei N, Fesharaki MG, Maleki S, Mohamadian M. Relationship between Burnout, Job Satisfaction and Demographic Factors with the Level of Patient Safety Culture in Military Healthcare Staff. *Journal of Military Medicine*. 2018;19(6):571-8.

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