

Research Paper: Perspectives of Teaching Hospitals' Medical Staff of the Dimensions of Patient Safety Culture



Maryam Ebrahimabadi¹, Mahmood Karimy², Hossein Poorcheraghi³, Vahid Naseri Salahshoor², Andrew Fournier⁴, Ahmadreza Abedi^{5*}

1. Department of Medical- Surgical Nursing, School of Nursing, Arak University of Medical Sciences, Arak, Iran.
2. Social Determinants of Health Research Center, Saveh University of Medical Sciences, Saveh, Iran.
3. Students' Scientific Research Center, Tehran University of Medical Sciences, Tehran, Iran.
4. Academic Member of College of Doctoral Studies, Grand Canyon University, Phoenix, Arizona, USA.
5. Department of Medical-Surgical Nursing, Traditional and Complementary Medicine Research Center, School of Nursing, Arak University of Medical Sciences, Arak, Iran.



Citation Ebrahimabadi, M., et al. 2022. Perspectives of Teaching Hospitals' Medical Staff of the Dimensions of Patient Safety Culture. *Journal of Client-Centered Nursing Care*, 8(1), pp. 15-22. <https://doi.org/10.32598/JCCNC.8.1.277.4>

doi <https://doi.org/10.32598/JCCNC.8.1.277.4>



Article info:

Received: 02 Sep 2021
Accepted: 07 Nov 2021
Published: 01 Feb 2022

Keywords:

Patient safety culture, Teaching hospital, Staff, Attitude, Hospital survey on patient safety culture

ABSTRACT

Background: Patient safety culture is a critical element in promoting safety and improving the quality of patient care. To enhance this culture, evaluation of the present culture is necessary. This study aims to investigate the dimensions of patient safety culture from the perspective of the staff of Saveh teaching hospitals, Saveh City, Iran.

Methods: This descriptive cross-sectional study was performed in two hospitals affiliated with Saveh University of Medical Sciences in 2019. The research sample consisted of 196 medical staff selected through the proportional stratified sampling method. The study data were collected through the Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire and analyzed by the independent t-test and Mann-Whitney test in SPSS software v. 21. The level of significance was set as $P < 0.05$.

Results: Among the 12 dimensions of the questionnaire, intra-organizational teamwork, by taking 76% of the total score (4.12 ± 0.28), was desirable and considered the best dimension. However, teamwork among organizational units, by taking 36.6% of the total score (2.92 ± 0.83), was in the poorest condition. There was a significant relationship between gender and patient safety culture, and women were more responsive to patient safety than men ($P < 0.05$).

Conclusion: According to the study findings, improving patient safety culture and intercommunication between hospital units is necessary. It is recommended to provide a more intimate environment for communication between hospital personnel.

* Corresponding Author:

Ahmadreza Abedi, RN, BSN, MSN.

Address: Department of Medical-Surgical Nursing, Traditional and Complementary Medicine Research Center, School of Nursing, Arak University of Medical Sciences, Arak, Iran.

Tel: +98 (912) 2552012

E-mail: abedi.a@arakmu.ac.ir

Highlights

- Intra-organizational teamwork was desirable and had the highest score among other dimensions, showing a strong point among medical staff.
- The teamwork across hospital units was poor, showing a weak point among the staff; it must be enhanced and improved.
- There was a significant relationship between gender and patient safety culture, indicating higher responsiveness of female staff to this issue.

Plain Language Summary

The current study investigated patient safety culture dimensions among two teaching hospital staff in Saveh City, Iran. The findings showed that intra-organizational teamwork was desirable, but teamwork across hospital departments was poor. The female staff was more responsive to patient safety culture. Improvement of patient safety culture and intercommunication between hospital units is necessary.

1. Introduction

According to the World Health Organization (WHO), “patient safety is defined as the absence of preventable harm to a patient during the process of health care” (Brasaitė, Kaunonen, & Suominen, 2015; Muftawu, & Aldogan, 2020). Health care is one of the most complex activities in which human beings are involved (Izadi, Drikvand, & Ebrazeh, 2013). Treatment is not always safe, and possibilities for medical errors threaten patient safety (Wachter, 2012; Moghaddasi, Sheikhtaheri, & Hashemi, 2007; Marin, 2004). Providing care without harming the patient is one of the most important criteria for healthcare delivery systems (Muftawu, & Aldogan, 2020; Poorcheraghi, Hekmatpou, & Mehrabi, 2019). Several studies have shown a high incidence of medical errors, and there are many gaps in the quality of global standards of health care (Stratton et al., 2004; Muftawu, & Aldogan, 2020). In the United States, 250000 patient deaths are reported annually due to medical errors (Karande, Marraro, & Spada, 2021). In 2008, Saudi Arabia reported 1356 deaths due to medical errors (Al-Ahmadi, 2009).

According to the studies in Iran, medication errors are the most common error threatening patient safety. One-third of patients referring to medical centers to get services have been involved with this issue. Also, 87.7% of medical staff in a study confirmed at least one or more medical errors during the previous year (Vaziri et al., 2019; Askarian et al., 2020). In a study examining the rate of medical errors through the investigation of public complaints, the proven rate of staff medical errors has

been estimated at 42%-53% (Sadoughi et al., 2011). To improve the quality of hospital services, health care organizations must pay attention to the culture of patient safety (Chen and Li, 2010; Bodur, & Filiz, 2010). Patient safety culture is defined as the beliefs, values, and norms of an organization that supports and promotes patient safety (Simsekler et al., 2020). These beliefs extend to all levels of an organization (e.g. system, department, unit) and influence the actions and behaviors of staff throughout the organization so that the staff and organization viewpoints demonstrate the priority of patient safety culture (Schutz, Counte, & Meurer, 2007; Farokhzadian, Nayeri, & Borhani, 2018). Studies have shown that hospitals with better patient safety standards have better performance and fewer errors (Mardon et al., 2010). Positive safety culture directs the behaviors of healthcare providers. Accordingly, patient safety becomes one of their highest priorities, requiring an emphasis on organizational learning, teamwork, open communication, feedback, non-punitive responses to errors, and a common perception in all medical staff, which leads to defined standards (Zwart et al., 2011; Castle, & Sonon, 2006; El-Jardali et al., 2010). Positive safety culture can encourage error reporting by health care providers, which will be an effective tool for improving safety (Salavati et al., 2013). The first step in creating a positive safety culture in hospitals is determining its condition. The occurrence of adverse events due to unsafe care is probably one of the 10 leading causes of death and disability in the world. It is estimated that 4 in every 10 patients is harmed while receiving hospital care which can be caused by a range of adverse events, with nearly 50% of them being preventable (Lawati et al., 2018; Huang, Wu, & Lee, 2018). Patient safety culture has been re-

ported as undesirable (Smits et al., 2008). Also, in a study in Iran, only 37% of staff reported their unit safety culture to be excellent (Yaghobi far et al., 2013). Assessing the safety culture of hospitals while identifying problem wards to improve their performance helps increase manager awareness of staff attitudes and behaviors about patient safety (Nieva, & Sorra, 2003). Patient safety culture is one of the components of health services' quality that is very important and also an essential element in monitoring the accreditation of medical centers (Gutberg and Berta, 2017). Evaluation of patient safety culture in hospitals is the first step toward building such a culture (Alquwez et al., 2018). This study aimed to investigate the patient safety culture from the viewpoints of medical staff in two teaching hospitals in Saveh City, Iran.

2. Materials and Methods

A cross-sectional descriptive study was conducted in selected teaching hospitals of Saveh City in 2019. Saveh, with a population of 238000 over an area of 10279 km², is situated in the central part of Iran near Tehran City (Karimy et al., 2016). The study population included medical staff (nurses, midwives, operating room technicians, anesthesiologists, radiologists, laboratory experts, and general physicians) in Saveh teaching hospitals. The sample size was estimated to be 196, using the limited population calculation formula (Cochran's formula) as below, and the samples were selected by proportional stratified sampling method.

$$n = \frac{z^2 pq}{d^2} \div \left(1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right) \right)$$

, where $\alpha=0.05$, $d=0.05$, $p=0.5$; $q=0.5$, $Z=1.96$, and $N=196$.

The inclusion criterion was having a professional experience of at least six months. The subjects were excluded from the study if they did not want to participate or had an incomplete answer to the questionnaire. Before starting the study, the necessary correspondence was made to the Ethics Committee of Saveh University of Medical Sciences and executive officials of the centers under investigation (Shahid Modarres and Shohadaye Hefdah Shahrivar). The study data were collected using the standard questionnaire of the Hospital Survey on Patient Safety Culture (HSOP-SC), designed by the US Agency for Health Research and Quality in 2004 (Vifladdt et al., 2016). In Iran, Moghry et al. used this tool for the first time at Tehran University of Medical Sciences (Moghri et al., 2012). The reliability of the questionnaire has been confirmed with a Cronbach α of 0.90 (Shamsadini Lori et al., 2016).

The first part of the questionnaire examines demographic information such as sex, age, marital status, and professional experience of the staff. The second part has 42 questions and assesses 12 different aspects of patient safety: frequency of events reported (3 items), overall perceptions of patient safety (4 items), manager/supervisor expectations and actions promoting safety (4 items), organizational learning/continuous improvement (3 items), teamwork across units (4 items), communication openness (3 items), feedback and communication about error (3 items), non-punitive response to error (3 items), staffing (4 items), management support for patient safety (3 items), teamwork within units (4 items), and hospital handoffs and transitions (4 items).

The questions are scored on a 5-point Likert scale from "completely agree" to "completely disagree". The average total score of the questionnaire groups into three categories: less than 40% of the total score of the questionnaire is considered an unfavorable situation, a score between 40% to 60% is regarded as an average situation, and a score between 60% to 100% a desirable situation. In the final analysis and according to the guideline for using the questionnaire, the dimensions with an average response of at least 70% of the total score of that dimension were considered as the strengths of safety culture (good group); dimensions with an average response between 50% and 70% of the total score of the dimension are considered neutral (average group), and less than 50%, is considered weak (weak group). At the end of the questionnaire, the participants were asked about patient safety in their units and the number of errors reported over the past 12 months. These questions were scored on a 5-point Likert scale (from "excellent" to "unacceptable" in the first question, and from no report to 21 or more" in the second question). The obtained data were presented as mean, standard deviation, and percentage and analyzed by the independent t-test and Mann-Whitney test in SPSS software v. 16.

3. Results

Table 1 presents the demographic characteristics of the samples. The Mean \pm SD score of patient safety culture was 3.45 \pm 0.21 out of 5. Among the 12 dimensions of the questionnaire, the highest and lowest Mean \pm SD belonged to the "teamwork within units" and "teamwork across units", respectively (Table 2). The findings showed that "intra-organizational teamwork", "overall perceptions of patient safety", and "hospital handoffs and transitions" with 76%, 72.3%, and 71.7% of the relevant score, respectively, were in a desirable condition. Dimensions of "teamwork among organizational units" and "feedback

Table 1. Demographic characteristics of the subjects

Variables		No. (%)
Sex	Male	20(10.2)
	Female	176(89.8)
Marital status	Single	150(76.5)
	Married	46(23.5)
Professional experience (y)	<1	46(19.6)
	1-5	63(32.2)
	6-10	43(21.6)
	11-15	19(14.6)
	16-20	14(7.4)
	>21	8(4.3)
Specialty	Nurse	120(61.3)
	Midwife	16(8.1)
	Operation room technician	13(6.6)
	Anesthesia technician	11(5.7)
	Laboratory technician	4(1.9)
	Radiologist	7(3.6)
	General physician	12(6.2)
	Anesthesiologist	13(6.6)

Client-Centered Nursing Care

and communication about error” with scores of 36.6% and 38.5%, respectively, were in poor condition.

The independent t-test results showed a significant relationship between gender and patient safety culture, and women were more responsive to patient safety than men ($P < 0.05$). However, there was no significant difference between patient safety culture and other demographic characteristics of the subjects, such as education level, marital status, and professional experience ($P > 0.05$) (Table 3).

4. Discussion

This study investigated the dimensions of patient safety culture among Saveh teaching hospital staff. The total Mean \pm SD of patient safety culture was 3.45 \pm 0.21, indicating a moderate level of patient safety culture. Some other studies show that the status of patient safety culture is moderate among teaching hospitals (Nekoei-Moghadam, Raadabadi, & Heidarijamebozorgi, 2020;

Almasi et al., 2015) which is consistent with our findings. These findings emphasize that the safety culture regarding different aspects of patient care in the studied hospitals needs improvement. In the present study, the “teamwork within units” dimension was favorable, consistent with other studies (Bodur and Filiz, 2010; Yaghoobi far et al., 2013; Westat et al., 2010; Amarapathy et al., 2013). However, Faryabi et al. found that the “teamwork within units” is at a moderate level (Faryabi et al., 2015). Based on our study results, the “teamwork across units” was poor, consistent with some other studies (Faryabi et al., 2015; Ravaghi et al., 2012). Some studies have found that “teamwork across units” is moderate (Bodur, & Filiz, 2010; Yaghoobi far et al., 2013; Westat et al., 2010; Mozafari et al., 2013), while Tabrizchi et al. found that the “teamwork across units” is favorable (Tabrizchi and Sedaghat, 2012). One of the reasons for the poor condition of teamwork across units in the present study may be inadequate training of personnel in this field and their high workload.

Table 2. Mean and percentage of the staff perspective on the dimensions of HSOPSC

Dimension	Mean±SD	Score Earned (%)	Status of Selected Hospitals
Organizational learning and continuous improvement	3.19±0.59	53.9	Average
Manager expectations and actions promoting safety	3.68±0.76	58.6	Average
Overall perceptions of patient safety	3.29±0.55	72.3	Favorable
Frequency of events reported	3.65±0.73	52.4	Average
Teamwork across hospital units	2.92±0.83	36.6	Poor
Communication openness	3.12±0.38	57.8	Average
Non-punitive response to error	3.93±0.49	50.6	Average
Feedback and communication about error	2.98±0.65	38.5	Poor
Teamwork within units	4.12±0.28	76	Favorable
Hospital handoffs and transitions	3.88±0.59	71.7	Favorable
Staffing	3.56±0.64	55.2	Average
Management support for patient safety	3.13±0.60	49.4	Average
Total	3.45±0.21	52.9	Average

Client- Centered Nursing Care

The “hospital handoffs and transitions” dimension was weak, which is consistent with the study of [Nekoei-Moghadam et al. \(2015\)](#), while in other studies, it was average ([Sabouri et al., 2017](#); [Kiaei et al., 2016](#)). The high workload may lead to the poor condition of “hospital handoffs and transitions”. Moderate level of patient safety culture could be due to punitive culture, which

dominates the hospitals, unjust distribution of nurses in the units, and lack of support for patient safety by head nurses and managers ([Nekoei-Moghadam, Raadabadi, & Heidarijamebozorgi, 2015](#)).

The results showed that female staff was more responsive to patient safety culture than male staff. Other studies also found the most significant relationship between

Table 3. Relationship between dimensions of patient safety culture and demographic characteristics of the staff

Variables	Mean±SD	P	Statistical Test	
Sex	Male	1.18±0.18	0.03	Independent t-test
	Female	4.25±0.25		
Marital status	Single	2.23±0.24	0.89	Independent t-test
	Married	3.42±0.31		
Professional experience (y)	<1	3.56±0.19	0.77	Mann-Whitney
	1-5	3.89±0.20		
	6-10	3.28±0.23		
	11-15	3.21±0.31		
	16-20	3.12±0.17		
>21	3.01±0.28			

Client- Centered Nursing Care

patient safety culture and gender (Shamsadini Lori et al.; 2016; Kabir et al., 2013; Moghri et al., 2012). Two important factors that may have led to this significant relationship are giving importance to the assigned work and responsibilities, as well as women's sharpness and sensitivity (Galvão et al., 2018). It has been shown that women are more sensitive than men in adherence to safety, quality of patient care, and ethics (Dehghani and Mohammadkhan Kermanshahi, 2012).

Creating a safe atmosphere in the hospitals where the employees can report errors without fear of being blamed and determining the number of nursing staff in different units based on each department's workload could help enhance patient safety culture among the staff. Regarding the limitations of the research, this study is descriptive and limited to a specific region of Iran. Also, self-reporting always has its limits.

5. Conclusion

One of the important factors contributing to patient safety in hospitals and medical centers is patient safety culture. The present study's findings showed a moderate level of patient safety culture among the staff of Saveh teaching hospitals. Also, the "intra-organizational teamwork" dimension was in the best position, and "teamwork among organizational units" was in the poorest condition.

Educational workshops focused on patient safety to enhance patient safety culture, as well as the use of social networks to keep staff information up to date about patient safety, could help improve the patient safety culture. Adequate staffing and error reporting are essential and necessary in enhancing patient safety. Considering the weak condition of teamwork across hospital units and less observance of safety culture among male staff, healthcare managers and hospital policymakers should design policies and plans by examining the relevant causes in this field. Further studies with larger sample sizes and qualitative studies on this subject are recommended, too.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Medical Ethics Committee of Saveh University of Medical Sciences (Code: IR.SAVEHUMS.REC.1396.27). The study participants were assured of the confidentiality of their information, and they provided written consent to participate in the study.

Funding

This project was financially supported by the Vice-Chancellor of the Research Department of Saveh University of Medical Sciences.

Authors' contributions

All authors contributed to this article and read and approved the final manuscript for submission.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

The authors appreciate the Research Council of Saveh University of Medical Sciences for the financial support and all study participants for their time and energy spent on this study.

References

- Al-Ahmadi, T. A., 2009. Measuring patient safety culture in Riyadh's hospitals: A comparison between public and private hospitals. *The Journal of the Egyptian Public Health Association*, 84(5-6), pp. 479-500. [PMID]
- Almasi, A., et al. 2015. [Evaluation of patient safety culture in personnel of hospitals in Kermanshah, 2103 (Persian)]. *Journal of Clinical Research in Paramedical Sciences*, 4(1), p. e81582. <https://brief.land/jcrps/articles/81582.html>
- Alquwez, N., et al. 2018. Nurses' perceptions of patient safety culture in three hospitals in Saudi Arabia. *Journal of Nursing Scholarship*, 50(4), pp. 422-31. [DOI:10.1111/jnu.12394] [PMID]
- Amarapathy, M., et al. 2013. Factors affecting patient safety culture in a tertiary care hospital in Sri Lanka. *International Journal of Scientific & Technology Research*, 2(3), pp. 173-80. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.300.3924&rep=rep1&type=pdf>
- Askarian, M., et al. 2020. Prevalence of non-reporting of hospital medical errors in the Islamic Republic of Iran. *Eastern Mediterranean Health Journal*, 26(11), pp. 1339-46. [DOI:10.26719/emhj.19.050] [PMID]
- Bodur, S. & Filiz, E., 2010. Validity and reliability of Turkish version of "Hospital Survey on Patient Safety Culture" and perception of patient safety in public hospitals in Turkey. *BMC Health Services Research*, 10, p. 28. [DOI:10.1186/1472-6963-10-28] [PMID] [PMCID]
- Brasaitė, I., Kaunonen, M. & Suominen, T., 2015. Healthcare professionals' knowledge, attitudes and skills regarding patient safety: A systematic literature review. *Scandinavian Journal of Caring Sciences*, 29(1), pp. 30-50. [DOI:10.1111/scs.12136] [PMID]

- Castle, N. & Sonon, K., 2006. A culture of patient safety in nursing homes. *BMJ Quality & Safety*, 15(6), pp. 405-8. [DOI:10.1136/qshc.2006.018424] [PMID] [PMCID]
- Chen, I. C. & Li, H. H., 2010. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC). *BMC Health Services Research*, 10, p. 152. [DOI:10.1186/1472-6963-10-152] [PMID] [PMCID]
- Dehghani, A. & Mohammad Khan Kermanshahi, S., 2012. [Evaluating of compliance with professional ethical standards in nursing practice from nursing staff's viewpoints in Tehran University of Medical Sciences (Persian)]. *Modern Care Journal*, 9(3), pp. 208-16. <http://sid.bums.ac.ir/dspace/handle/bums/4972>
- El-Jardali, F., et al. 2010. The current state of patient safety culture in Lebanese hospitals: A study at baseline. *International Journal for Quality in Health Care*, 22(5), pp. 386-95. [DOI:10.1093/itqhc/mzq047] [PMID]
- Farokhzadian, J., Nayeri, N. D. & Borhani, F., 2018. The long way ahead to achieve an effective patient safety culture: Challenges perceived by nurses. *BMC Health Services Research*, 18(1), p. 654. [DOI:10.1186/s12913-018-3467-1] [PMID] [PMCID]
- Faryabi, R., et al. 2015. [The Investigation of the patient safety culture status in Hospitals of Jiroft City in 2014 (Persian)]. *Journal of Health Chimes*, 2(4), pp. 23-30. <http://jms.thums.ac.ir/article-1-122-en.html>
- Galvão, T. F., et al. 2018. Patient safety culture in a university hospital. *Revista Latino-Americana de Enfermagem*, 26, p. e3014. [DOI:10.1590/1518-8345.2257.3014] [PMID] [PMCID]
- Gutberg, J. & Berta, W., 2017. Understanding middle managers' influence in implementing patient safety culture. *BMC Health Services Research*, 17(1), p. 583. [DOI:10.1186/s12913-017-2533-4] [PMID] [PMCID]
- Huang, C. H., Wu, H. H. & Lee, Y. C., 2018. The perceptions of patient safety culture: A difference between physicians and nurses in Taiwan. *Applied Nursing Research*, 40, pp. 39-44. [DOI:10.1016/j.apnr.2017.12.010] [PMID]
- Izadi, A. R., Drikvand, J. & Ebrazeh, A., 2013. [The patient safety culture in Fatemeh Zahra hospital of Najafabad, Iran (Persian)]. *Health Information Management*, 9(6), pp. 895-907. <http://him.mui.ac.ir/index.php/him/article/view/309/1224>
- Kabir, M., et al. 2013. The perspectives toward patient safety culture among nurses staff in educational hospitals in Gorgan in 2011. *Iranian Journal of Health Sciences*, 1(1), pp. 75-83. [DOI:10.18869/acadpub.jhs.1.1.75]
- Karande, S., Marraro, G. & Spada, C., 2021. Minimizing medical errors to improve patient safety: An essential mission ahead. *Journal of Postgraduate Medicine*, 67(1), pp. 1-3. [DOI:10.4103/jpgm.JPGM_1376_20] [PMID] [PMCID]
- Karimy, M., et al. 2016. Does the theory-driven program affect the risky behavior of drug injecting users in a healthy city? A quasi-experimental study. *Medical Journal of the Islamic Republic of Iran*, 30, p. 314. [PMID] [PMCID]
- Kiaei, M. Z., et al. 2016. Patient safety culture in teaching hospitals in Iran: Assessment by the hospital survey on patient safety culture (HSOPSC). *Journal of Health Management & Informatics*, 3(2), pp. 51-6. https://jhmi.sums.ac.ir/article_42666.html
- Al Lawati, M. H., et al. 2018. Patient safety and safety culture in primary health care: A systematic review. *BMC Family Practice*, 19(1), p. 104. [DOI:10.1186/s12875-018-0793-7] [PMID] [PMCID]
- Mardon, R. E., et al. 2010. Exploring relationships between hospital patient safety culture and adverse events. *Journal of Patient Safety*, 6(4), pp. 226-32. [DOI:10.1097/PTS.0b013e3181fd1a00] [PMID]
- de Marin, H., 2004. *Improving patient safety with technology*. Amsterdam: Elsevier. https://www.google.com/books/edition/Improving_Patient_Safety_with_Technology/=en
- Moghaddasi, H., Sheikhtaheri, A. & Hashemi, N., 2007. [Reducing medication errors: Role of computerized physician order entry system (Persian)]. *Journal of Health Administration*, 10(27), pp. 57-67. <http://jha.iuums.ac.ir/article-1-74-en.html>
- Moghri, J., et al. 2012. The psychometric properties of the Farsi version of "Hospital survey on patient safety culture" in Iran's hospitals. *Iranian Journal of Public Health*, 41(4), pp. 80-6. [PMID] [PMCID]
- Mozafari, J., et al. 2013. Emergency medicine residents perception about patient safety culture. *Advances in Biological Research*, 7(5), pp. 155-8. [DOI:10.5829/idosi.abr.2013.7.5.74191]
- Muftawu, M. & Aldogan, E. U., 2020. Measuring patient safety culture: A study at a teaching hospital in Ghana. *Journal of Patient Safety and Risk Management*, 25(6), pp. 250-8. [DOI:10.1177/2516043520938534]
- Nekoei-Moghadam, M., Raadabadi, M. & Heidarijamebozorgi, M., 2020. Patient safety culture in university hospital's emergency departments: A case study. *The International Journal of Health Planning and Management*, 35(4), pp. 852-88. [DOI:10.1002/hpm.2948] [PMID]
- Nieva, V. & Sorra, J., 2003. Safety culture assessment: A tool for improving patient safety in healthcare organizations. *BMJ Quality & Safety*, 12(Suppl 2), pp. ii17-23. [DOI:10.1136/qhc.12.suppl_2.ii17] [PMID] [PMCID]
- Poorcheraghi, H., Hekmatpou, D. & Mehrabi, F., 2019. The quality of life of patients with different leukemia types. *Journal of Client-Centered Nursing Care*, 5(2), pp. 97-104. [DOI:10.32598/JCCNC.5.2.97]
- Ravaghi, H., et al. 2012. [The relationship between health care providers' perceptions of patient safety culture and patients' perceptions of medical errors in teaching hospitals in Tehran: 2011 (Persian)]. *Journal of Health Administration*, 15(48), pp. 57-68. <http://jha.iuums.ac.ir/article-1-965-en.html>
- Sabouri, M., et al. 2017. Patient safety culture as viewed by medical and diagnostic staff of selected Tehran hospitals, Iran. *Hospital Practices and Research*, 2(1), pp. 15-20. [DOI:10.15171/hpr.2017.04]
- Sadoughi, F., et al. 2011. [Patient safety information system: Purpose, structure and functions (Persian)]. *Journal of Mazandaran University of Medical Sciences*, 21(85), pp. 174-88. <http://jmums.mazums.ac.ir/article-1-848-en.html>
- Salavati, S., et al. 2013. [Nurses' perspectives on patient safety culture (Persian)]. *Iran Journal of Nursing*, 26(84), pp. 24-33. <http://ijn.iuums.ac.ir/article-1-1628-en.html>
- Schutz, A. L., Counte, M. A. & Meurer, S., 2007. Development of a patient safety culture measurement tool for ambulatory health care settings: Analysis of content validity. *Health Care Management Science*, 10(2), pp. 139-49. [DOI:10.1007/s10729-007-9014-y] [PMID]

- Shamsadini Lori, A., et al. 2016. [Patient safety culture from the viewpoint of nurses of teaching hospitals affiliated with Shahid Beheshti University of Medical Sciences (Persian)]. *Health-Based Research*, 2(1), pp. 81-92. <http://hbrj.kmu.ac.ir/article-1-67-en.html>
- Simsekler, M. C. E., et al. 2020. Evaluation of patient safety culture using a random forest algorithm. *Reliability Engineering & System Safety*, 204, p. 107186. [DOI:10.1016/j.res.2020.107186]
- Smits, M., et al. 2008. The psychometric properties of the 'Hospital Survey on Patient Safety Culture' in Dutch hospitals. *BMC Health Services Research*, 8, p. 230. [DOI:10.1186/1472-6963-8-230] [PMID] [PMCID]
- Stratton, K. M., et al. 2004. Reporting of medication errors by pediatric nurses. *Journal of Pediatric Nursing*, 19(6), pp. 385-92. [DOI:10.1016/j.pedn.2004.11.007] [PMID]
- Tabrizchi, N. & Sedaghat, M., 2012. The first study of patient safety culture in Iranian primary health centers. *Acta Medica Iranica*, 50(7), pp. 505-10. [PMID]
- Vaziri, S., et al. 2019. Prevalence of medical errors in Iran: A systematic review and meta-analysis. *BMC Health Services Research*, 19(1), p. 622. [DOI:10.1186/s12913-019-4464-8] [PMID] [PMCID]
- Vifladt, A., et al. 2016. The association between patient safety culture and burnout and sense of coherence: A cross-sectional study in restructured and not restructured intensive care units. *Intensive and Critical Care Nursing*, 36, pp. 26-34. [DOI:10.1016/j.iccn.2016.03.004] [PMID]
- Wachter, R. M., 2012. *Understanding patient safety*. 2nd ed. New York: Mcgraw-hill. <https://www.google.com/books/=1&dq=Understanding+Patient+Safety&printsec=frontcover>
- Westat R, et al. 2010. *Hospital Survey on Patient Safety Culture: 2010 User Comparative Database Report*. 2010. <https://www.ahrq.gov/sites/default/files/publications/files/hosp-surv111.pdf>
- Yaghoobi Far, M., et al. 2013. [The survey of patient safety culture and recognizing its weaknesses and strengths in Sabzevar hospitals: 2011 (Persian)]. *Journal of Sabzevar University of Medical Sciences*, 20(2), pp. 154-64. http://jsums.medsab.ac.ir/article_325.html?lang=en
- Zwart, D. L. M., et al. 2011. Patient safety culture measurement in general practice. Clinimetric properties of 'SCOPE'. *BMC Family Practice*, 12, p. 117. [DOI:10.1186/1471-2296-12-117] [PMID] [PMCID]