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# MEASURING PATIENT SAFETY CULTURE IN A UNIVERSITY HOSPITAL FROM THE VIEWPOINTS OF REGISTERED NURSES: A DESCRIPTIVE CROSS SECTIONAL STUDY

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**A R T I C L E   I N F O**

**A B S T R A C T**

Introduction: Creating safety culture (SC) is the most important step in guaranteeing and improving patient safety (PS) and the first step in improving PS is assessing the SC of the hospitals. The purpose of the present study was to examine the aspects of patient safety-culture and to identify its strengths and weaknesses of from the nurses' perspective.
Method: The study was descriptive cross-sectional. The sample was 214 people selected using Cochran formula and convenient sampling from among the nurses working in the largest university hospital in Kermanshah, west Iran. Hospital Survey on Patient Safety Culure (HSOPSC) and personal information inventory were used to collect data. Data were analyzed using the Mann-Whitney Test, Kruskal–Wallis Test with the help of SPSS 19 at the significance level of 0.05.
Results: The total mean of the positive response rate of SC was 48.93 ± 14.07. The organizational learning area had the highest positive rating. The SC in the areas of giving feedback to errors, the frequency of reporting events, staff-related work issues, open communication channels, and non-punitive responses to errors had less than 50% points and needed serious intervention for promotion. Moreover, during the last year, 68.5% of nurses had no reports of any errors. SC scores had no significant correlation with individual variables of the nurses.
Conclusion: Patient safety culture (PSC) does not enjoy a good status in the studied hospital from the nurses' perspectives and needs planning and interventions of the hospital management for improvement of patient safety. Regarding this, systemic dealing with the events, creating non-punitive culture concerning errors, attention to solving employees' problems, and creating open communication between managers and employees must be given priority in management interventions.

## Introduction

Of the critical points in health care system is service quality, and PS is of its most important components [1]. PS refers to prevention and reduction of adverse events that might harm the patients during service provision [2]. Treatment measures are of the most critical activities in service delivery. According to the World Health Organization, tens of millions of people die or suffer a disability annually due to clinical errors and unsafe treatment processes. However, 50 to 70% of these injuries could be prevented and moderated [3]. This has rendered PS to be discussed as one of the global health concerns [4].

Given the importance of patient safety, several models have been proposed to improve it, one of which is the National PS Agency (NPSA) of England, where creating SC is the first step in achieving PS [5]. Nowadays, attention to SC has been widely considered by care organizations [6]. The SC comes from the values, attitudes and behaviors of the staff and the style of the health and safety program of a health care organization concerning the safety of patients [7]. PSC can be defined as the adoption and the use of PS as the first priority and value in the organization [8]. SC is the builder of the key condition for

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improving safety and a positive SC directs the behaviors of health care providers to ensure PS is one of their highest priorities [6]. PSC is effective in maintaining and improving PS among health care providers [9]. It should be noted that the most important obstacle to improve patient care is the SC of health care organizations [10].

Organizations with a positive SC are based on mutual trust-based communication, are recognized as an important safety feature by taking effective preventive measures, and shared understanding. Of the most important aspects of SC is the management commitment for safety, trust-based open communications, safety education, teamwork, common belief in the importance of safety and non-punitive behavior with unwanted incidents and errors [11].

Most past studies have shown that the safety conditions as inappropriate in patient care and emphasized the improvement of therapeutic procedures and processes [12]. In a majority of previous studies, the weakness of SC has been reported in transmission, reporting, and non-punitive responses to mistakes [1,6,13]. Moreover, safety improvement is not just a clinical topic and is also connected with organizational dimensions [22]. Some studies show that improving SC in an organization is generally possible through multilateral interventions in all aspects of SC [11]. The scholars believe that hospitals should establish PSC among their staff to improve the quality and safety of health care, along with structural interventions in the organization [15, 22].

Various factors improve patient's safety, the most important of which is perhaps is the attitude and functioning of caring staff, especially nurses. Nurses usually play a vital role in promoting patient's SC and are considered the key to this [16]. A study has shown that 58% of deaths from medical errors in USA are preventable, and this error reduction has been linked to appropriate communication patterns, fair reward systems, self-control, and support for nurses [22]. Promoting SC can promote nursing care. In this regard, reviewing the views of nurses as the largest care group in is very important [3].

The studies show that the hospitals with better SC own better performance, fewer incidences, and higher patient satisfaction [17, 18]. Thus, hospital managers should try to create a stronger SC to reduce medical errors [18, 19]. In Iran, in response to increasing medical errors and increasing public attention and public opinion about this, the Ministry of Health has set the issue of PS as a priority and always supports the efforts made in this regard. Currently, the Iran Ministry of Health has introduced the rule of clinical services in hospitals, one of the focuses of which is PS [20]. As the first phase of the PS improvement plan is the assessment of the hospital's SC, in this regard, reviewing the views of nurses on planning appropriate management interventions is of great importance. Thus, the purpose of this study was to investigate the aspects of PSC and identify the aspects with priority of intervention in the largest university hospital in west Iran.


**Materials and methods**

This was a cross-sectional descriptive study. The population was all nurses (470 people) working in the largest university hospital in Kermanshah, west Iran. The sample was 214 people selected using Cochran formula (N = 470, Z = 1.95, P = 0.5, d = 0.05) and convenient sampling method. Data collection tool was personal and organizational information questionnaire, and the Persian version of Hospital Survey on PSC [33], which was completed as self-report. Personal information questionnaire included age, gender, marital status, educational level, work area, hospital record, and occupation (bedside nurse, head nurse, supervisor).

The standard PSC questionnaire was designed by the Agency for Quality of Health Care Research in 2004. The questionnaire has 42 questions that evaluate PSC in a hospital in twelve areas (team work within units, expectation and actions of unit supervisor to improve patient safety, management support of PS, organizational learning, continuous improvement, overall understanding of PS, providing feedback to errors, open communication channels, frequency of reporting events, teamwork between units, staffing issues, delivery and evolution in the hospital, and non-punitive responses to errors). The responses are in five-option Likert (from totally agree to totally disagree). "Totally agree" and "agree" were positive responses, "no idea" neutral, and "totally disagree" and "disagree" were negative answers. In the inverse questions, the numbers A14, A12, A10, A8, A7, A5 F11, and F9, F7, F6, F5, F3, F2, B4, B3, A17, and A16, "totally agree" and "agree" were positive answers; and in question C6, never and rarely were considered as positive. For each person, the percentage of positive responses was calculated in each area, and then the average positive response was calculated for all participants [16, 21].

The score of each area is equal to the average percentage of the positive responses of that area.

The aspects with a positive response rate of above 75% were strong, aspects with a positive response rate of between 50% and 75% as acceptable, and aspects with a positive response rate of less than 50% were weak aspects [6]. In the previous studies, the construct validity of the Persian version of SC questionnaire was confirmed through confirmatory factor analysis, internal correlation and interstitial correlation [22, 23, 24]; and its reliability by re-test with alpha coefficient from 0.84 to 0.92 [16,22,23,24,21].

Data analysis was performed using descriptive and inferential statistics with the help of spss 19 at descriptive and inferential levels. In the descriptive statistics, frequency, percentage, mean and standard deviation; and in inferential statistics, Kolmogorov-Smirnov test was used for data normalization. Mann-Whitney Test, Kruskal–Wallis Test, and Spearman correlation coefficients were used for data analysis.

To collect data, 214 nurses were selected by convenient sampling. The questionnaires were distributed to the participants during a week in different work shifts and were collected after completion on the same day. The inclusion criteria included at

least six years of clinical work experience, undergraduate or postgraduate degrees in nursing, and consenting to participate in the study. Incomplete questionnaires were excluded from the study. Ethical considerations were the permission to conduct a study from the hospital management, getting the informed consent from the participants, the ability to leave the study, anonymity of the questionnaires, and the confidentiality of information.

**Results**

In this study, 203 questionnaires were fully completed and returned (completion rate was 94.86%). The majority (78.8%) of the participants were female nurses, and more than half (52.7%) were single. Moreover, 87.7% of the individuals were graduates from nursing bachelor's degree (Table 1). The mean age of the nurses was 31.64 ± 6.05 and their mean work history was 5.68±3.59 years.

**Table 1:** Frequency distribution of subjects based on individual characteristics

| Variables | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 43 | 21.2 |
| | Female | 160 | 78.8 |
| Marital status | Single | 107 | 52.7 |
| | Married | 93 | 45.8 |
| | Divorced | 3 | 1.5 |
| Age | Less than 30 | 93 | 45.8 |
| | 31-40 | 91 | 44.8 |
| | More than 40 | 19 | 9.4 |
| Education | BS | 178 | 87.7 |
| | MS | 25 | 12.3 |
| Work history in the current unit | Less than 5 years | 168 | 82.8 |
| | 5-10 | 32 | 15.8 |
| | More than 10 | 3 | 1.5 |
| Work history | Less than 5 years | 100 | 49.3 |
| | 5-10 | 95 | 46.8 |
| | More than 10 | 8 | 3.9 |
| Position | Supervisor | 3 | 1.5 |
| | Head-nurse | 3 | 1.5 |
| | Head-nurse substitute | 10 | 4.9 |
| | Clinical nurse | 187 | 92.1 |

The average total positive response rate to twelve areas of SC was 48.93 ± 14.07 percent. The organizational learning had the highest and the non-punitive response to the errors had the lowest average percentage of positive responses. According to the ranking of scores in the fields of the questionnaire, SC in the organizational learning, continuous improvement at the desired level in the areas of teamwork within the units, expectations and management measures to promote PS, overall understanding of PS, management support for PS, the transmission and exchange of patient information at acceptable levels in the areas of providing feedback to errors, the frequency of reporting events, employee work issues, open communication channels, and non-punitive responses to errors is at weak levels (Table 2).

**Table 2:** Mean and standard deviation of the percentage of positive responses of different aspects of hospital SC from in nurses' idea

| Areas | Number of questions | Mean | SD | Rating of the area |
|---|---|---|---|---|
| Teamwork within units | 4 | 66.62 | 28.53 | 2 |
| Manager expectations and actions to improve patient safety | 4 | 61.69 | 28.50 | 3 |
| Management support of PS | 3 | 55.33 | 33.78 | 6 |
| Organizational learning, continuous improvement | 3 | 75.86 | 26.79 | 1 |
| A general understanding of PS | 4 | 57.14 | 24.58 | 4 |
| Providing feedback to events and errors | 3 | 45.64* | 35.04 | 8 |
| Openness of communication channels | 3 | 24.63* | 25.81 | 11 |
| Frequency of reporting events | 3 | 41.70* | 37.83 | 9 |
| Teamwork among units | 4 | 50 | 30.36 | 7 |
| Work related issues of the staff | 4 | 27.33* | 21.48 | 10 |
| Transfer and exchanging patient information | 4 | 56.89 | 29.35 | 5 |
| Non-punitive response to errors | 3 | 15.59* | 23.97 | 12 |
| Overall PSC score | 42 | 48.93* | 14.07 | |

\* Average percentage is less than 50

Moreover, more than 68% of nurses did not report any errors or accidents in the last 12 months **[Chart 1]**, and 54.7% of nurses reported a safe state of the patients in the hospital and 22.7% reported t as weak.
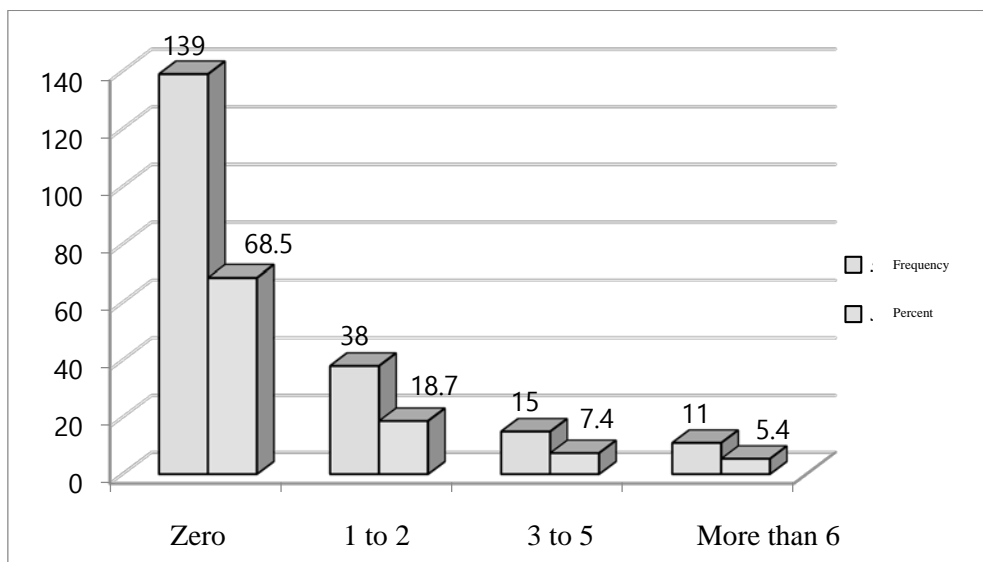


Explanatory plotting 1

Chart 1: Relative and absolute frequency of reported events by the subjects in the last 12 months
Kolmogorov-Smirnov test showed that the hospital's SC did not have normal distribution (P = 0.066, Z= 0.032). Thus, non-parametric Mann-Whitney-U and Kruskal–Wallis tests were used to analyze the data. The results of Whitney-U and Kruskal–Wallis tests showed that SC scores did not show any significant relationship with gender, age, marital status, educational level, service record, and service record in current unit and nurses' occupation **[Table 3]**.

**Table 3:** Comparison of the mean scores of SC in terms of demographic variables in the nurses

| Variables | | Variable levels | Mean rank | Test statistic | P-value |
|---|---|---|---|---|---|
| SC | Gender | Male | 102.94 | -0.119 | 0.906 |
| | | Female | 101.75 | | |
| | Marital status | Single | 105.22 | 2.36 | 0.306 |
| | | Married | 99.81 | | |
| | | Divorced | 55.17 | | |
| | Age | Less than 30 | 108.56 | 2.80 | 0.246 |
| | | 31-40 | 94.38 | | |
| | | More than 40 | 106.39 | | |
| | Education | BS | 102.66 | -0.428 | 0.669 |
| | | MS | 97.30 | | |
| | Work history in the current unit | Less than 5 years | 102.25 | 0.80 | 0.670 |
| | | 5-10 | 103.48 | | |
| | | More than 10 | 72.17 | | |
| | Work history | Less than 5 years | 101.33 | 0.028 | 0.986 |
| | | 5-10 | 102.71 | | |
| | | More than 10 | 102.19 | | |
| | Position | Supervisor | 121 | 3.19 | 0.362 |
| | | Head-nurse | 157.67 | | |
| | | Staff | 106.75 | | |
| | | Bedside nurse | 100.55 | | |

**Discussion**

In recent years, Iran Ministry of Health has started its plan to improve PS by PS-friendly hospitals projects; one of the most important prerequisites and the first step for of this project was to evaluate the status quo of PSC and efforts to improve it. The study used one of the most widely used instruments for assessing SC, has been used to measure the PSC. Evaluation of the status of SC helps hospitals become aware of the various aspects of PS needing careful consideration. Moreover, it allows hospitals to identify the strengths and weaknesses of their SC in case of patient.

In the present study, the areas of providing feedback to errors, the openness of communication channels, the frequency of reporting errors, work-related issues of staff, and the non-punitive response to errors had undesirable states and need serious attention, especially the two areas of non-punitive response to incidents and work-related issues of staff that had the lowest score. However, some other aspects, such as organizational learning and teamwork within the units had the highest score and considered as the strengths of the hospital in SC.

Ranking of the aspects of SC questionnaire indicted that the strongest area of PSC was organizational learning, continuous improvement and within-unit teamwork. In line with most studies, the strongest areas of PSC were "organizational learning and continuous improvement" and "teamwork within units" [1,2,20-22,25-31]. In the study by El-Jardali et al., teamwork in the units, organizational learning and continuous improvement of the dimensions had the highest SC scores [32]. In the study by Badr et al., the highest areas has been reported to be positive attitude of caregivers regarding teamwork within the units and continuous learning. In the study of the US [33]. which was conducted on a large number of hospitals, organizational learning dimensions got the highest levels, which is consistent with the present study. Inconsistent with our study, some studies have reported the manager's expectations for promoting safety [34]. and the frequency of incidence reporting [20] as strengths of the SC. It should be noted that one of the important ways to improve PSC is individual and organizational learning and gaining experience from the mistakes happening in the hospital; it is clear that this needs appropriate leadership in the teams providing care and a culture that eases this process [28]. It appears that the implementation of Clinical Governance Program at academic hospitals since 2009 could be effective in improving some SC areas, such as organizational learning and continuous improvement and teamwork within units, as one of the important aspects of clinical governance is providing and improving PS.

On the other hand, in the present study, the lowest positive points were related to non-punitive response to errors and employee-related issues. Consistent with the present study, non-punitive response to errors and staff-related issues have been reported as the greatest weaknesses in SC of the patient in the majority of internal and external studies [26, 27, 34, 35, 20,

28, 22, 2, 29]. Inconsistent with our study, in some studies, providing feedback on incidents and errors [6]. the frequency of reporting errors, and the exchange and transmission of patient information [35,36], and management expectations and measures regarding PS [25] have been reported as the weakest areas of SC. The results of this study were consistent with the study of the US Agency for Quality and Health Care Research 2009 [36] in terms of the strongest and weakest areas of PSC. The American Medical Association of Doctors has advised that organizations should eliminate punitive actions with incidents and mistakes to promote these two areas, and consider mistakes as an opportunity for employees to learn [32]. Hospital managers and policy makers should promote performance and activities in a non-punitive environment. Systematic analysis of the causes of incidents compared with punitive encounters can increase the level of reporting of errors by staff and enhance the level of PS [37]. It appears that in a culture where manager seek to blame, punish, and reprimand employees at the time of an incident, employees will tend to hide the error when committed rather than attempting to report it and prevent its consequences. This may lead to exacerbating of the effects of an initial error and have irreparable effects on patients. It looks that the management of the studied hospital should think of creating a positive climate for SC by a non-punitive culture and a systematic look towards the accidents and analyzes the causes.

In case of the weakness of issues-related issues of the staff in the present study, it seems that the shortage of nurses and their high volume of work in the hospital resulted in a weak point of view in this regard. This can end in job dissatisfaction and burnout in the nurses in the long run and have negative consequences for PS.

According to the present study, 68.5% of nurses had no reports of any errors during the past year. Non-reporting of errors by nurses over the past year in Akbari et al. (2017), Afshari et al (2016) and Salavati et al. (2013) was close to this study. Inconsistently, the degree of non-report of errors in some studies was less than that of the present study [22, 25,34,36]. In Tabaraee et al. (2013), it has been higher than that of the present study. The more error reporting the providers of the services have, it is a more positive feature for PSC. By increase in the report of unplanned incidents by the staff, the quality and safety of services in care organizations are boosted [28]. In order to increase the willingness to voluntary reporting of the incidents, it is recommended that the feedback mechanisms of events set as a priority. The efforts in this regard will be more effective compared to other aspects of the patient's SC [38]. The excessive high rate of non-reporting of errors in the present study could show the willingness of personnel not to report many cases of errors [13]. Probably, one of the reasons for this is the punitive culture prevailing in the hospitals and the fear of personnel of the consequences of reporting errors.

From the perspective of more than half of the nurses, PS status was at an acceptable level, and only 25% reported PS as good and excellent. This finding is consistent with some studies [6,38-39]. However, in contrast to Akbari (2017), 59.1% of nurses reported a poor overall level of PS. In the study by Badr et al. (2017), most caregivers reported PS status as good and excellent. In hospitals where employees have a more positive view of SC, there is a greater tendency for PS assessments in care [39]. The differences in these views could be due to differences in SC in the hospitals under study.

The results of this study indicated no significant relationship between SC with demographic variables including gender, age, marital status, educational level, and service record of the current unit. Consistently, in most studies, gender, education, and age of nurses were not significantly correlated with SC [6,16,22]. Inconsistently, in Almasi et al. (2013), nurses work record had a significant positive correlation with SC scores. In Badr et al. (2017), higher education levels and training on safety and work in small hospitals was correlated with a more positive SC. In Vlayen et al. (2015), nurses working in pediatric and psychiatric units had a more positive view towards SC compared to emergency nurses and operating room and nurses with less than one year work record. It seems that more studies are required in this regard. The increasing attention to technology and progress in the care and treatment of patients in hospitals should not prevent special attention to the role of nurses as the largest provider of care.

Assessing the current status of SC helps the organizations become aware of the different aspects of PS needing serious attention. It also allows hospitals and care providers sections to identify the weaknesses and strengths of their organizational culture in the area of PS and problems in this regard [22]. The results of this study can help explain the role of SC in preventing errors in the hospital and justify the need for establishment of a positive SC in the organization. As the occurrence of errors in hospitals, besides being life-threatening to patients, will cost a great deal both to the patient and to the hospital, and ultimately to society, the investment of hospitals to establish and improve the patient's SC by reducing the occurrence of these errors and associated costs can lead to return of capital to hospitals [2].

Conducting the study in a care facility, convenient sampling and data collection as self-report were among the limitations of this study that can be effective in generalizing the results.

### Conclusion

The results indicated that PSC status in the hospital was not favorable given the nurses' views, which needing hospital-management attention in this regard. Here, "openness of communication channels," "issues related to the number and distribution of employees and their hours of work," "non-punitive responses to errors," and "frequency of reporting accidents and errors" were the weakest areas of SC in need of serious interventions to promote SC. It is suggested that the culture of non-punitive dealing concerning incidents and errors be established in the hospitals and an atmosphere be created in which employees report their mistakes without fear of reprisal and punishment and provide an opportunity for their own and their colleagues to learn from these mistakes. Certainly, this change needs the support of top management of the

organization and requires a relatively long time for institutionalization. It is also necessary to increase the number of employees - especially in positions and sectors with high workload, reducing staff working hours and standardizing time, and creating reporting systems and encouraging staff to report errors – to improve PSC.

**References**

1. Mohebi Far R, Alijan zade M, Safari Variani A, Khoshtarkib H, Ghanati E, Teymouri F, et al . Studying patient safety culture from the viewpoint of staffs in educational hospitals in Tehran City. JHSW. 2015; 5 (1) :57-64 URL: http://jhsw.tums.ac.ir/article-1-5243-fa.html

2. Ravaghi H, Barati Marnani A, Hosseini A F, Takbiri A. The Relationship between Health Care Providers' Perceptions of Patient Safety Culture and Patients' Perceptions of Medical Errors in Teaching Hospitals in Tehran: 2011 . jha. 2012; 15 (48) :57-68 URL: http://jha.iums.ac.ir/article-1-965-fa.html

3. Jafarjalal E, Jafarpour H, Dehghan Nayeri N, Haghani H. Relationship between Perceptions of Organizational Culture with Patients' Safety Behavior among Nurses in Babol. Hayat. 2013; 19 (3) :5-16. URL: http://hayat.tums.ac.ir/article-1-611-fa.html

4. Patel S, Wu AW. Safety culture in Indian hospitals: A cultural adaptation of the safety attitudes questionnaire. Journal of patient safety. 2016 Jun 1;12(2):75-81.

5. National Patient Safety Agency. Seven steps to patient safety the full reference guide.2004, Available from: URL: www.npsa.nhs.uk/sevensteps/

6. Salavati S, Fanoosi T, Dehghan D, Tabesh H. Nurses' Perspectives on Patient Safety Culture. IJN. 2013; 26 (84) :24-33. URL: http://ijn.iums.ac.ir/article-1-1628-fa.html

7. Verbakel NJ, Langelaan M, Verheij TJ, Wagner C, Zwart DL. Improving patient safety culture in primary care: a systematic review. Journal of patient safety. 2016 Sep 1;12(3):152-8.  doi: 10.1097/PTS.0000000000000075

8. Bodur S, Filiz E. A survey on patient safety culture in primary healthcare services in Turkey. International Journal for Quality in Health Care. 2009 Aug 22;21(5):348-55. https://doi.org/10.1093/intqhc/mzp035

9. Bishop AC, Boyle TA. The role of safety culture in influencing provider perceptions of patient safety. Journal of patient safety. 2016 Dec 1; 12(4):204-9. doi: 10.1097/PTS.0000000000000092

10. Goldstein DH, Nyce JM, Van Den Kerkhof EG. Safety Perceptions of Health Care Leaders in 2 Canadian Academic Acute Care Centers. Journal of patient safety. 2017 Jun 1;13(2):62-8. doi: 10.1097/PTS.0000000000000112

11. Halligan M, Zecevic A. Safety culture in healthcare: a review of concepts, dimensions, measures and progress. Quality and Safety in Health Care. 2011 Apr 1;20(4):338-43. http://dx.doi.org/10.1136/bmjqs.2010.040964

12. Cooper D. Safety culture. Professional Safety. 2002 Jun 1;47(6):30.

13. Moghri j, Akbari Sari A, Rahimi Forooshani A, Arab M. Patient Safety Culture Status in General Hospitals Affiliated to Tehran University of Medical Sciences . Hakim Health Sys Res . 2013; 16 (3) :243-250. URL: http://hakim.hbi.ir/article-1-1185-fa.html

14. Smits M, Wagner C, Spreeuwenberg P, Van der Wal G, Groenewegen PP. Measuring patient safety culture: an assessment of the clustering of responses at unit level and hospital level. Quality and Safety in Health Care. 2009 Aug 1; 18(4):292-6. http://dx.doi.org/10.1136/qshc.2007.025965

15. Smits M, Christiaans-Dingelhoff I, Wagner C, van der Wal G, Groenewegen PP. The psychometric properties of the'Hospital Survey on Patient Safety Culture'in Dutch hospitals. BMC health services research. 2008 Nov 7; 8(1):230. https://doi.org/10.1186/1472-6963-8-230

16. Almasi A, Pourmirza Kalhori R, Ahmadi Jouybari T, Goodarzi A, Ahmadi AR. Evaluation of patient safety culture in personnel of hospitals in Kermanshah, 2013. J Clin Res Paramed Sci 2015; 4(1):14-23. http://journals.kums.ac.ir/ojs/index.php/PramedJ/article/view/2581

17. Hartmann CW, Meterko M, Rosen AK, Zhao S, Shokeen P, Singer S, Gaba DM. Relationship of hospital organizational culture to patient safety climate in the Veterans Health Administration. Medical Care Research and Review. 2009 Jun;66(3):320-38. https://doi.org/10.1177/1077558709331812

18. Stock GN, Stock GN, McFadden KL, McFadden KL. Improving service operations: linking safety culture to hospital performance. Journal of Service Management. 2017 Mar 20;28(1):57-84. https://doi.org/10.1108/JOSM-02-2016-0036

19. Ford EW, Silvera GA, Kazley AS, Diana ML, Huerta TR. Assessing the relationship between patient safety culture and EHR strategy. International journal of health care quality assurance. 2016 Jul 11;29(6):614-27. https://doi.org/10.1108/IJHCQA-10-2015-0125

20. Momeni B, Golpira R, Mayelafshar M. The study of the domains of patient safety culture in Rajaie Cardiovascular, Medical and Research Center in 2012. Cardiovascular Nursing Journal. 2014; 3 (1) :34-41.   URL: http://journal.icns.org.ir/article-1-169-fa.html

21. Abdi Zh, Maleki MR, Khosravi A. Perceptions of patient safety culture among staff of selected hospitals affiliated to Tehran University of Medical Sciences. Payesh 2011; 10(4):411-419. http://en.journals.sid.ir/ViewPaper.aspx?ID=209269

22. Moghri J, Ghanbarnezhad A, Moghri M, Rahimi Forooshani A, Akbari Sari A, Arab M. Validation of Farsi version of hospital survey on patient Safety culture questionnaire, using confirmatory factor analysis method . jhosp. 2012; 11 (2) :19-30. URL: http://jhosp.tums.ac.ir/article-1-26-en.html

23. Ebadi fard azar F, Rezapoor A, Tanoomand Khoushehmehr A, Bayat R, Arabloo J, Rezapoor Z. Study of patients'safety culture in Selected Training hospitals affiliated whith Tehran university of medical sciences. jhosp. 2012; 11 (2) :55-64. URL: http://jhosp.tums.ac.ir/article-1-28-fa.html

24. Saari A, Forooshani A. [The psychometric properties of the farsi version of "Hospital Survey on Patient Safety Culture" in iran's hospitals]. Iran J Public Health. 2012;41(4).]:80-6. Persian http://ijph.tums.ac.ir/index.php/ijph/article/view/2593

25. Badr HE, AlFadalah T, El-Jardali F. Towards promoting patient safety practices: Baseline assessment of patient safety culture in three private hospitals. International Journal of Healthcare Management. 2017 Oct 18:1-8. http://dx.doi.org/10.1080/20479700.2017.1390958

26. Akbari N, Malek M, Ebrahimi P, Haghani H, Aazami S. Safety culture in the maternity unit of hospitals in Ilam province, Iran: a census survey using HSOPSC tool. Pan African Medical Journal. 2017 Oct 8;27(268). doi:10.11604/pamj.2017.27.268.9776

27. Afshari A, Piruzi M, Afshari S, Hejab K. Patient safety culture assessment in Seidolshohada hospital of Semirom. IJNR. 2016; 11 (1) :1-8. URL: http://ijnr.ir/article-1-1662-fa.html

28. Tabaraee Y، HaghGoshaee E، Takbiri A، Yaghobifar MA. The survey of patient safety culture and recognizing its weaknesses and strengths in Sabzevar hospitals: 2011. Journal of Sabzevar University of Medical Sciences, 2013; 20(2): 154-164. http://jsums.medsab.ac.ir/article_325.html

29. Chen IC, Li HH. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC). BMC Health Services Research. 2010 Jun 7;10(1):152. https://doi.org/10.1186/1472-6963-10-152

30. Van Noord I, de Bruijne MC, Twisk JW. The relationship between patient safety culture and the implementation of organizational patient safety defences at emergency departments. International Journal for Quality in Health Care. 2010 Apr 9;22(3):162-9. https://doi.org/10.1093/intqhc/mzq013

31. Alahmadi HA. Assessment of patient safety culture in Saudi Arabian hospitals. Qual Saf Health Care. 2010 Oct 1;19(5):e17-. http://dx.doi.org/10.1136/qshc.2009.033258

32. El-Jardali F, Jaafar M, Dimassi H, Jamal D, Hamdan R. The current state of patient safety culture in Lebanese hospitals: a study at baseline. International Journal for Quality in Health Care. 2010 Aug 10;22(5):386-95. https://doi.org/10.1093/intqhc/mzq047

33. HSOPSC, 2007; Hospital Survey on Patient Safety Culture, Comparative Database Report. [Cited 2017 Nov 20]. http://www.ahrq.gov/ qual/hospsurveydb

34. Arshadi Bostanabad M, Jebreili M, kargari Rezapour M. Patient safety culture assessment in neonatal intensive care units of tabriz from the perspective of nurses in 2013. IJNR. 2015; 10 (3) :26-35 URL: http://ijnr.ir/article-1-1560-fa.html

35. Vlayen A, Schrooten W, Wami W, Aerts M, Barrado LG, Claes N, Hellings J. Variability of patient safety culture in Belgian acute hospitals. Journal of patient safety. 2015 Jun 1;11(2):110-21. doi: 10.1097/PTS.0b013e31829c74a3

36. Sorra J, Famolaro Th, Dyer N,Nelson D, Khanna K.Hospital Survey on Patient Safety Culture 2009: User Comparative Database Report: Agency for Healthcare Reserch and Qoality;2009.

37. Ko Y, Yu S. The relationships among perceived patients' safety culture, intention to report errors, and leader coaching behavior of nurses in Korea: A pilot study. Journal of patient safety. 2017 Sep 1;13(3):175-83. doi: 10.1097/PTS.0000000000000224

38. Burlison JD, Quillivan RR, Kath LM, Zhou Y, Courtney SC, Cheng C, Hoffman JM. A Multilevel Analysis of US Hospital Patient Safety Culture Relationships With Perceptions of Voluntary Event Reporting. Journal of patient safety. 2016 Nov 3. doi: 10.1097/PTS.0000000000000336

39. Thorp J, Baqai W, Witters D, Harter J, Agrawal S, Kanitkar K, Pappas J. Workplace engagement and workers' compensation claims as predictors for patient safety culture. Journal of patient safety. 2012 Dec 1;8(4):194-201. doi: 10.1097/PTS.0b013e3182699942