Original Article

Does safety climate make sense in hospitals of a developing country?

Mahmood Nekoei-Moghadam [1], Mohammadreza Amiresmaili [2]

[1.] Associate professor, Research center for health services management, Kerman University of Medical Sciences, Kerman, Iran
[2.] Assistant professor, Research center for health services management, Kerman University of Medical Sciences

amiresmaili@kmu.ac.ir

Abstract:
Introduction: Healthcare as a high hazard industry, should work to enhance their patient safety. To achieve this objective, they first have to identify their existing safety climate status.
Methods: This study was conducted in summer of 2010. We assessed safety climate Using Hospital Survey On Patient Safety Culture (HSOPSC). 385 employees of three teaching hospitals affiliated with Kerman University of Medical Sciences participated in the study. The results were expressed as percentage of positive answers toward patient safety.
Results: Patient safety culture scores were low to average in all dimensions. Supervisor expectations and actions promoting patient safety and teamwork within units received the highest scores in all three hospitals, while non punitive response to error attained the least score in studied hospitals.
Conclusion: The studied hospitals, relying on their strengths concerning patient's safety climate and trying to resolve their weaknesses, would be able to create a safe and suitable environment which supports patient safety. Establishing a system for reporting errors, encouraging staff to report events and applying non- punitive response to prevent the errors are suggested.

1. Introduction

Since the dawn of civilization, people were aware that they could inadvertently commit errors or mistakes. With modern industrialization, conscious attempts were made to reduce worker error or fault (1). Two policy documents have particularly determined attitudes to this issue: To Err is Human published by the Institute of Medicine in the United States and - An organization With a Memory – a policy document published by the UK Department of Health. Both of these reports describe how organizational culture can influence the attitudes and behavior of individual employees and highlight the importance of a system based approach to facilitate the development of an organizational culture that promotes safe practice in health organizations (2). Organizational culture' can be thought of as the shared beliefs, norms and values of the people that work in an organization (3). Culture creates a sense of identity and establishes a vital link between an organization's members and its mission, and is considered the strongest determinant of the success or failure of an organization (4, 5).

Safety culture as one of subdivisions of organizational culture was mentioned for the first time in Chernobyl report in 1986 (6). Following this report, high hazard industries such as aviation and nuclear set up began to define and to measure safety culture as a method to decrease event occurrence probability (7). Historically their safety measures have been based on retrospective data of employee fatalities and injuries. Recently driven by the awareness that organizational, managerial and human factors rather than simply technical failures are prime causes

of accidents, high hazardous industries have focused on predictive measures of safety (8). Because the healthcare industry involves high risk for morbidity and mortality, Institute of Medicine recommended healthcare organizations should work to enhance their patient safety culture (9). Safety culture is a product of values, attitudes, perceptions, competencies and individual and group behavior patterns which determines the degree of commitment and safety management style of an organization (10). A "safety" culture is one that integrates the Hippocratic maxim of "first do no harm" into the very fiber of its identity, infuses it into the norms and operations of an entire organization, and elevates it to the level of a top priority mission (5).

Patient safety is an important factor in healthcare quality, with increasing effort of healthcare organizations in continuous quality improvement, the importance of creating safety culture has been increasingly acknowledged (11) and there is currently a major drive to improve patient safety culture in many countries (12). This requires understanding values, ideas and norms about important factors of an organization and also attitudes and behaviors which are important regarding patient safety culture (13). An organization with positive safety culture is characterized with trustful communications, joint perception about the importance of safety and a firm belief on the efficiency of predictive means 11. Having such a culture is identified as a key element in improving safety (14). Other dominant characteristics of organization with positive safety culture are their perception of safety importance and their commitment to safety as an important organizational priority (13, 15, and 16). An organization that successfully develops a safety culture can expect to realize immediate and tangible results in reducing workplace accidents and their associated costs, including decreased productivity, employee morale, and increased hiring and training costs (17). Creating such a culture in a professional context is an important challenge for hospital managers. It necessitates a clear view of aspects that need improvement and a great commitment at the top levels of the organization (18).

Although the debate over the definition of safety culture has not reached unanimous agreement, a similar term "safety climate" has been used frequently in the literature and has added to confusion (19). From the time the term was first highlighted by Zohar in 1980, the literature has not presented a generally accepted definition of safety climate either (20). In fact, some definitions of safety climate are most identical to definitions of safety culture. However, based on some definitions safety climate differ from safety culture:

- Safety climate is a psychological phenomenon which is usually defined as the perception of the state of safety at a particular time.
- Safety climate is closely concerned with intangible issues such as situational and environmental factors.
- Safety climate is a temporal phenomenon, a snap shot of safety culture, relatively unstable and subject to change on the other hand safety culture is an enduring characteristic of an organization that is reflected in its consistent way of dealing with critical safety issues (19).

Hospital survey on patient safety culture (HSOPSC) has been considered as a safety climate survey (8, 21) because self-report surveys allow for measuring an organization safety climate, while, safety culture can be accessed through other means such as interviews or observations (22). The first safety climate development stage is to define the organizations existing safety climate, in fact the real work of improving health care services delivery and measuring the effect on patient safety, begins after communicating survey results to staff and managers (2). Furthermore, many experts agree that any safety focused initiatives should be preceded by culture change in order to be successful (1, 11). Consequently, this study reports the result of a patient safety culture measurement in three Iranian teaching hospitals affiliated with kerman university of medical sciences as a first step toward improving patient safety.

2. Materials and Methods
2.1. Study setting and design
The present descriptive study was carried out in Shahid Bahonar, Afzalipoor and Shafa Hospitals using a cross sectional method in the summer of 2010. All of these three hospitals are affiliated with Kerman University of Medical sciences. Research population in the study was consisted of all employees working in teaching hospitals of Kerman University of Medical Science.

2.2. Methods
400 employees were selected using stratified and simple random sampling. Several tools have been developed for measuring patient's safety culture/climate in health care organizations (23-28). For the aim of this study we applied HSOPSC which was developed on behalf of the Agency for health care Research and Quality (29) because its Persian version validity was confirmed in previous study (30). This instrument consists of 9 parts. In the first part, patient's safety in respondent's workplace was studied; in the second part, manager's and supervisor's expectations and actions regarding safety culture were studied; third part was about communications; in the fourth

part, level of event report was studied; fifth part was about patient's safety score; sixth part was about the status of patient's safety in hospital; in the seventh part, number of reported events was studied; part eight background information was considered; and the ninth part examined, employees comments in relation to patient's safety through an open ended question. Anonymous questionnaires ensured the confidentiality.

The same exclusion criteria used in the original questionnaire were applied. Incomplete surveys were removed prior to analysis. Each dimension included three or four items with an answer scale from 1 to 5. The exclusion criteria were: (no entire section completed; fewer than half the items answered; and all items answered the same) Percentages were calculated on the number of respondents for the specific question or dimension. Answers 1 and 2 were considered negative towards patient safety, 3 was considered neutral and answer 4 and 5 were considered positive towards patient safety. A number of questions were negatively worded to avoid response set. These answers were reversed prior to recoding into positive, neutral or negative. The dimensional scores were expressed as the percentage of positive answers towards patient safety within each dimension. Dimensions acquired at least 75% positive scores considered as strength, those between 50-75 percent considered neutral and dimension with less than 50% positive scores labeled as weakness. The study was approved by ethical committee of Kerman University of medical sciences (K/87/139).

2.3. Limitations of HSOPSC
• One of the main limitations of HSOPSC is its inability to explore the relationship between safety climate scores and patient outcomes. This was the case for the present study too, although we did not intend to explore such relationship.
• Although the authors of the HSOPSC claimed the questionnaire to be suitable for all employees either in direct or indirect contact with patients, but this has been questioned in other studies 31 Therefore, we measured safety culture by only asking the staff who were at direct contact with patients to fill in the questionnaires and excluding other staff, we might have gained different results if we would have included all staff in the study.

3. Results
390 completed questionnaires were returned (response rate = 97.5%) of them 5 were set aside according to exclusion criteria and 385 were included in the final analysis. Of them, 119 (16 male) were from Shahid Bahonar Hospital; 131 (21 male) from Shafa Hospital; and 135 (31 male) from AfzaliPoor Hospital. At the time of survey 184 employees (47.8%)had been working in the hospital less than 10 years , 139 participants (36.1%) between 11-20 years and 62 (16.1) were working more than 21 years. Regarding Primary work area/ unit 101 (26.3%) of the studied employees were working in medical units while only 7 individuals (1.8%) were from rehabilitation department. Nurses were the dominant job category with 210 participants in the study followed by nurse assistants and radiology technicians with 58 and 30 participants accordingly. Near 80 percent of the participants were working in the hospital 20-59 hours per week (Table 1). The dimensional positive culture scores in studied hospitals are illustrated and compared with AHRQ benchmark in table 2. The hospitals received low to average scores in all dimensions and no positive dimension regarding patient safety culture was achieved in studied hospitals. Lowest percent of positive safety climate scores were found on these dimensions:
• Non–punitive response to error (21.5-26.3 %).
• Staffing (36.8-40.2 %)
• Safety score (31-42.8 %)
• Hospital management support (38.5-45 %)
• The dimension "teamwork within hospital units" received the highest positive score (62.4-70.2 %) (Table 2).

4. Discussions
We did not find any strength (Positive safety culture percentage above 75%) regarding patient safety in the studied hospitals; in Shahid Bahonar and Shafa Hospitals, team work and supervisor/manager expectations and actions promoting patients safety achieved the highest positive score while patient's safety score and non-punitive response to errors were considered as the main Weaknesses of these hospitals. At Afzalipoor Hospital, however, the highest positive score was related to teamwork within units, continuous improvement, feedback and communications about errors and supervisor/manager expectations and actions promoting patient safety; on the other hand, non-punitive response to errors and patient's safety score received the least positive score and were considered the weak points of this hospital. Moreover, no guideline was present in these hospitals for reporting the errors and events (Table1). These findings are same and consistent with Tupper (32), Amiresmaili et al. (30), and also Helling's findings (18). In Hellinges study, team work within the units received the highest percent of positive

546

safety culture. High level of this aspect in these hospitals shows that there is an appropriate environment in each unit of the hospitals which plays an important role in improving patient's safety.

Table 1. Population Characteristics

	Frequency	Percent
Primary work area/ unit		
Medical units	101	26.3
Surgical units	58	15.0
Operating theatre	22	5.7
Obstetrics	18	4.7
Pediatrics	10	2.6
Intensive care units (ICU,CCU,NICU,PICU)	56	14.5
Emergency department	47	12.2
Rehabilitation	7	1.8
Diagnosis (Laboratory, Radiology, CT Scan)	53	13.8
Outpatient department	13	3.4
Professional Experience		
Less than one year	6	1.6
1-5 years	94	24.4
6-10 years	84	21.8
11-15 years	69	17.9
16-20 years	70	18.2
21 years or more	62	16.1
Working time in hospital		
Less than 20 hours per week	11	2.9
20-39 hours per week	133	34.5
40-59 hours per week	172	44.7
60 hours or more per week	69	17.9
Staff position		
Nurse	210	54.5
Nurse assistant	58	15.1
Radiology technician	30	7.8
Laboratory technician	23	6.0
Physiotherapist	7	1.8
Midwife	10	2.6
Housekeeping worker	27	7.0
Head nurse	20	5.2

Event reporting is critical for identifying patient safety issues and represents a core prerequisite of effective clinical risk management (31). Effective events reporting requires an atmosphere in which employees can, with no fear of punishment, report the actual or potential errors and mistakes which is the main property of a non-punitive safety culture 2, the present study showed that this aspect of safety culture had the lowest score in all of these hospitals. Similar findings have been observed in previous studies (31, 33) Amiresmaili et al. (30) found that punitive response to error to be the most significant weakness of patient safety culture in their study, this finding reinforce the necessity of developing a non-punitive climate in Iranian hospitals, in addition, Jeongeun et al. concluded that most of nurses in Korean hospitals do not feel free to express their concern on patient safety issues, and the fact that event reporting and safety culture did not caught attentions sufficiently(33) It is apparent that when there is fear in the hospital, staff will do everything possible to hide errors and filter data (34) because they believe that mistakes they make are kept in their personal file and if this kind of perception is institutionalized across the hospital, no learning based on previous mistakes will be achieved and this seriously threaten patient safety.
Senior management in each plays an important role in improving safety culture in every organization (35) and in this case, every organization can plan and guide its actions more efficiently in the field of improving safety culture. Sine believes that main determinants of safety culture such as management support and communications influence other

dimensions of safety culture (36). However, findings concerning management support in the field of patient's safety revealed that none of the mentioned hospitals had a good performance in this respect and thus this aspect of safety culture had been regarded as a negative point in these three hospitals. Researchers of safety culture are aware of this problem and believe that only a few senior managers in hospitals have devoted enough time and resources for patient's safety (37).

What was very considerable in this research was that in all of these three hospitals, no official mechanism was present for reporting probable errors and events. However, some of the respondents announced that they reported some problems related to patient's safety using non-official channels such as workarounds or friendly meetings.

Table 2: Positive culture percents at studied hospitals compared with AHRQ Benchmark*

Dimension	AHRQ Benchmark	Shahid Bahonar	Status	Shafa	Status	Afzali Poor	Status
Supervisor/manager expectations & actions promoting patient safety	71	68.3	Neutral	65.9	Neutral	54.2	Neutral
Organizational learning – continuous improvement	71	58	Neutral	59.8	Neutral	54.6	Neutral
Teamwork within units	74	70.2	Neutral	62.4	Neutral	66.1	Neutral
Communication openness	61	48.2	Weakness	49.3	Weakness	43	Weakness
Feedback & communications about error	52	58.8	Neutral	61.8	Neutral	54.5	Neutral
Non punitive response to error	43	26.3	Weakness	24.7	Weakness	21.5	Weakness
Staffing	50	36.8	Weakness	40.2	Weakness	38.5	Weakness
Hospital management support	60	45.6	Weakness	41.4	Weakness	38.5	Weakness
Teamwork across hospital units	53	50.4	Neutral	37.2	Weakness	37.8	Weakness
Hospital handoffs & transitions	48	51.5	Neutral	44.8	Weakness	37.8	Weakness
Overall perceptions of safety	56	54.2	Neutral	62.3	Neutral	43.1	Weakness
Frequency of events reported	52	41.5	Weakness	42	Weakness	35.3	Weakness
Patient's safety score	71	31	Weakness	42.8	Weakness	34	Weakness
Reported events	In the studied hospitals, no system was observed for reporting accidents and events						

* Source: AHRQ Benchmark, Sorra JS, Nieva VF. Hospital Survey on Patient Safety Culture. (Prepared by Westat, under Contract No. 290-96-0004). AHRQ Publication No. 04-0041. Rockville, MD: Agency for Healthcare Research and Quality. September 2004

5. Conclusion

In summary, our study permitted identification of hospitals patient safety climate dimensions. In particular, it allowed us to have a clear understanding of different dimensions of the current climate. Our data demonstrated the urgent need of hospitals for formulating safety-oriented strategies and acquiring senior management support for safety actions in order to strengthen positive culture across hospitals. A culture of safety, in which everyone accepts responsibility for patient safety is necessary before other patient safety practices are introduced, otherwise individuals expected to implement the safety initiatives are unable to effectively communicate or work together. Lack of an established mechanism to report the event inhibits the hospitals from reviewing events systematically;

this finding highlights the importance of developing a reporting system as a priority for these hospitals. This study highlighted the importance of cultural change prior to any safety initiative.

Corresponding Author:
Mohammadreza Amiresmaili
Health services administration department,
Kerman University of Medical Sciences, Kerman, Iran
Tel: +98.91269365404
E-mail: amiresmaili@kmu.ac.ir and mohammadreza.amiresmaili@gmail.com

References
1. Peters GA and Peters BJ, Medical errors and patient safety; Human factors in medicine, CRC Press, Taylor and Francis group. 2008.
2. European Credit Reaearch Institiute (ECRI). 2005. 10-5-2009.
3. Wilkson A. Understanding organizational culture and the implications for corporate marketing. Eur J Mark. 2001;35:353-67.
4. Cooper M. Towards a model of safety culture. Safety Science. 2000;36:111-36.
5. Greenberg J, Baron R. Behavior in Organizations. sixth ed. Upper Saddle River NJ: Prentice Hall. 1997.
6. Sorenson JN. Safety culture: a survey of the state-of-the-art. ReliabEngin Syst Saf. 2002;76:189-204.
7. Zohar D. Safety climate in industrial organizations: theoretical and applied implications. Journal of Applied Psychology. 2000;65:96-102.
8. Colla J, Bracken AC, KInney LM, Weeks WB. Measuring patient safety climate: a review of surveys. Qual Saf Health Care. 2005;14:364-6.
9. Kohn LT, Corrigan JM, Donaldson MS. To err is human: building a safer health system. Washington, DC: National Academy Press. 1997.
10. Organizing for safety: third report of the human factors study group of ACSNI. Sudbury: Health and Safety Commission. Health and Safety Commission. 2003
11. Agency for Health Research and Quality Hospital Survey On Patient Safety Culture. 2004.
12. Flin R, Measuring safety culture in healthcare: A case for accurate diagnosis, safety sciences. 2007; 45: 653-67
13. Pitcher D. Organizational Culture and Patient Safety. 2002.
14. Singer SJ, Gaba D, Geppert JJ, etal. The culture of safety:Results from an organization- wide survey in 15 California hospitals. Qual Saf Health Care. 2003;12(2):112-8.
15. Gaba D. Culture of Safety in Hospitals: What is it? How can it be measured? How can it be improved? 2002.
16. Leape L. Can we make health care safe? The Institute Coalition on Health Care - The Institute for Healthcare Improvement. 2000.
17. Rogers D. The Importance of Developing a Safety Culture. Available Online at: http://www.hrtutor.com/en/news_rss/articles/2004/Developing_Safety_Culture.aspx
18. Hellings J, Schrooten W, Klazinga N, Vleugels A. Challenging safety culture; survey results. International journal of healthcare quality assurance. 2007;20(7):620-32.
19. Wiegmann DA, Zhang H, Thaden TV, Sharma G, Mitchell A. A synthesis of safety culture and safety climate research. Federal Aviation Administration Atlantic city international Airport. 2002. Report No.: ARL-02-3/FAA-02-2.
20. Wiegmann DA, Shappel SA. Human error analysis of commercial aviaiation accidents: Application of the human factors analysis and classification system. Aviation space and Environmental Medicine. 2001;72(11):1006-16.
21. Flin, R., Burns, C., Mearns, K., Yule, S., Robertson, E.M. Measuring safety climate in healthcare. Quality and Safety in Health Care. 2006; 15:109–15.
22. Guldenmund, F.W. The nature of safety culture: a review of theory and research. Safety Science. 2000; 34:215–57.
23. Fleming, M. Patient safety culture measurement and improvement: A 'How To' guide. Healthcare Quarterly. 2005; 8:14–9.

24. Gershon, R., Stone, P., Bakken, S., Larson, E. Measurement of organizational culture and climate in healthcare. Journal of Nursing Research. 2004; 34:33–40.
25. Weingart SN, Farbstein K, Davis RB: Using a multi hospital survey to examine the safety culture. jt Comm J Qual Saf. 2004; 30:125-32.
26. Sexton JB, Thomas EJ, Helmreich RL, etal. Frontline assessments of healthcare culture:Safety Attitudes Questionnaires norms and psychomrtrics properties. Austin, TX, The University of Texas center of Excellence for patient safety Research and Practice. Sponsored by the Agency for Healthcare Research and Quality. 2004; 290-96-0004.
27. Evaluation of the culture of safety:survey of clinicians and managers in an academic medical center: Qual Saf Health Care. 2003; 12:405-10.
28. Gaba DM, Singer SJ, Sinaiko AD, Bowen JD, Ciavarelli AP. Differences in safety climate between hospital personnel and naval aviators. Hum Factors. 2003 Summer;45(2):173-85. Pubmed PMID: 14529192
29. Sorra JS, NIeva VF. AHRQ Benchmark,Hospital Survey on Patient Safety Culture. (Prepared by Westat, under Contract No. 290-96-0004). AHRQ Publication No. 04-0041. Rockville, MD: Agency for Healthcare Research and Quality. 2004.
30. Amiresmaili MR, Tourani S and Barati O. Measuring safety culture and setting priorities for action at an Iranian hospital, Al Ameen J Med Sci. 2010; 3 (3):237-45
31. Pfeiffer Y and Manser T. Development of the German version of the Hospital Survey on Patient Safety Culture: Dimensionality and psychometric properties, safety science. 2010; 48:1452-62
32. Klingner J, Moscovice I, Tupper J, Coburn A, Wakefield M. Implementing patient safety initiatives in rural hospitals. J Rural Health. 2009 Fall;25(4):352-7. doi: 10.1111/j.1748-0361.2009.00243.x. PMID: 19780914
33. Jeongeun K, Kyungeh A, Minah KK, Yoonsook H. Nurses' Perception of Error Reporting and Patient Safety Culture in Korea. Western Journal of Nursing Research. 2007;29(7):827-44.
34. Vancamp L. Total quality management and the culture of organization. European journal of Emergency medicine. 2009;4:59.
35. Yule SJ, Flin R, Murdy AJ. Modeling managerial influence on safety climate. Sandiego 2001, April 27-29.
36. Sine, David M. Interactive Qualitative Assessment of Patient Safety Culture Survey Scores. Journal of Patient Safety. 2008;4(2):78-83.
37. Leape LL, Berwick DM. Five years after To Err is human: what have we learned? JAMA 2005;239(19):2384-90.