Patient safety culture in teaching hospitals in Iran: assessment by the hospital survey on patient safety culture (HSOPSC)

Mohammad Zakaria Kiaei[1], Amir Ziaee[2], Rafat Mohebbifar[1*], Hamideh Khoshtarkib[1], Elnaz Ghanati[1], Azadeh Ahmadzadeh[1], Saeideh Teymoori[1], Omid Khosravizadeh[3], Masoumeh Zieaeeha[1]

ABSTRACT

Introduction: Patient safety culture is an important part of improvement in the safety of health care. Knowing its present status is required for development of safety culture. The present study aimed to evaluate the current status of Patient safety culture in hospitals of three central provinces of Iran.

Method: The present cross-sectional study was performed in teaching hospitals of Tehran, Alborz, and Qazvin provinces. The standard HSOPSC questionnaire was used for evaluation of the patient safety culture from the viewpoint of 522(Qazvin: 200, Tehran: 312, Alborz: 40) individuals who were randomly selected as workers of the hospitals. The collected data were analyzed using Chi-square and ANOVA tests.

Results: The mean positive response to 12 aspects of the patient safety was 62.9%. "Organizational learning" had the highest proportion of positive response (71.18%) and "Handoffs & Transitions" had the lowest (54.49%). There was a statistically significant difference in scores of "Teamwork within Units"(p=0.006,"Manager Expectations & actions promoting"(p=0.014),"organizational learning and continuous improvement"(p=0.001), "Management support"(p=0.007), "Feedback and communication"(p=0.012), and "Communication openness"(p=0.003) among the provinces, respectively.

Conclusion: We performed a full assessment of the patient safety culture in the studied provinces. Organizational learning was satisfactory in the hospitals. The studied hospitals need arrangement of safety-based programs and supports of senior administrators to perform more sophisticated efforts and improve the patient safety culture.

Keywords: Patient safety, Patient safety culture, Teaching hospitals

Introduction

Patient safety in health care organizations has been noticed after the report of American Medical Association entitled "human is for error; making a safer health system",(1) that has presented the prevalence of medical errors in the United State(2, 3). Patient safety in order to prevent the consequences of errors of imperfect diagnosis and treatment(4) is an important part of health care(5). During the past 2 decades, it has been globally thought that health systems are not safe adequately and should be promoted. So, patient safety is now the first priority of the health care system and its customers. The World Health Organization (WHO) recommends extensive attempts to decrease the frequency of adverse events, detection of their causes, and improvement of them(6). One fifth of general population are at risk of medical errors(7). A significant number of patients are exposed to adverse events and damages related to medical error during attendance in health care systems; particularly hospitals, so their problems worsens. This situation results in increased risks during provision of health care. Patients involved in consequences of medical errors are not forgettable. Therefore, patient safety becomes an important issue in health care systems of various countries(8).

Organizational culture notably contributes to effectiveness and achievement of organizations and has been noticed during the past two decades. Cultural change is the greatest challenge in development of a safe health care system(4). On the other hand, Patient safety is a critical part of quality of health care. Knowledge about patient safety culture becomes increasingly more important, as

[1] *School of Public Health, Qazvin University of Medical Sciences, Qazvin, Iran*

[2] *Metabolic Diseases Research Center, Qazvin University of Medical Sciences, Qazvin, Iran*

[3] *Management And Economics Research Center, Iran University of Medical Sciences, Tehran, Iran*

*****Corresponding Author:** *R Mohebbifar, Associate professor of Healthcare Management, School of Public Health, Qazvin University of Medical Sciences, Qazvin, Iran*
Email: manage.univ@gmail.com.

health care organizations try to improve the quality of health care(2).

Patient safety culture plays an important role in improving the patient safety in health care centers(9). The concept of patient safety culture originates from safety studies in hazardous industries(2). Study of patient safety culture can provide important feedbacks to health care systems to conduct improvement plans based on recognition of certain problems(10). When any member of an organization considers the importance of safety and organizes it among themselves, safety becomes a priceless part and priority in the organization. Then it change into culture in the organization which makes the organizational members to pay more attention to their tasks and perceive it as a value by any member of the organization during their work.

Sorra and Nieva (2003) have implied that safety culture in an organization results from personal and group values, insights, perceptions, suitability, behavioral model determining accountability, style, and efficacy of safety management in the organization. Patient safety culture has an intricate foundation which comprises various aspects of the organization and guides the patient safety behavior(11). 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(12).

Increase in the prevalence of medical errors in Iran and public concern about it has directed the attention of Iranian Ministry of Health authorities to patient safety and any efforts to its application(13). Patient safety is an important part of clinical governance which has been recently focused by Iranian health care centers. Most recent researches about the patient safety have been conducted in developed countries. There are some studies in this field from developing countries including Iran (14-17). This fact has been noticed by WHO, too. WHO has announced that it supports researches about the patient's safety, particularly in developing countries(18).

Treatment of patients and improvement in their health is the main objective of health care centers and hospitals. However, some errors and mistakes in the treatment process may sometimes harm the patients and complicate the treatment process. Recognition of these errors and their reduction is a priority in any health care center which should be administered by the authorities.

Patient safety has become an organized issue in developed countries now. However, most related studies have focused on the workers' safety or hospital's safety. 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. The present study was designed to evaluate the patient safety culture in hospitals of three central provinces of Iran including Tehran, Alborz, and Qazvin. The results can be used to perform modification acts for improvement of the situation in the related hospitals.

Methods

The present descriptive cross-sectional study was performed on 10 teaching hospitals of central provinces of Iran (Tehran, Alborz, and Qazvin) in 2013. In order to assure the validity of studied samples in this research, 552 hospital personnel (including doctors, nurses, administrative staff and paramedics) were randomly selected. Their distribution in the studied hospital was proportionate to the total number of the personnel in the hospitals. The study size was determined by a biostatistician.

After library study and collection of data about the patient safety in hospital care, the HSOPSC standard questionnaire (Hospital Survey on Patient Safety Culture) was selected for the study. It has been designed by Agency for Healthcare Research and Quality (AHRQ) in 2004 and is revised annually. It has been used by several studies to assess the views of hospital workers about the culture of patient safety worldwide(19). The study of Moghri and his colleagues has confirmed its validity and reliability in Iran. Cronbach's alpha coefficient was 0.82 (20).

The questionnaire assesses 12 aspects of patient safety culture. It has 43 items which are measured using 5 point Likert scale ranging from quite disagree to quite agree, or from never to always. The assessed aspects are:

A) Seven levels of safety culture including:
1) Manager expectations & actions promoting patient Safety (4 questions),
2) Organizational learning and continued improvement (3 questions),
3) Teamwork within units (4 questions),
4) Communication openness (3 questions),
5) Feedback and communication (3 questions),
6) Non-punitive response to error (3 questions), and
7) Situation of staffing (4 questions).

B) Three levels of patient safety including:
8) Management support from patient safety (3 questions),
9) Teamwork across units (4 questions), and
10) Handoffs &transitions (4 questions).

C) Results of two variables including:
11) Overall perceptions of safety (4 questions), and
12) Frequency of event reporting (3 questions).
Demographic characteristics of the individuals were also gathered.

The collected data were analyzed using SPSS16 statistical software. Chi- square, T-test, and analysis of variance were used for statistical analysis of the variables at a significance level of 0.05. Data collection was coordinated with hospitals. Information of patients remained confidential

Results

The studied individuals were 292 nurses (53.4%), 47 auxiliary health workers (8.6%), 36 physicians (7.6%), 31 operation room technicians (5.7%), 22 unit managers (4%), 15 speech therapists, audiologist or physiotherapists (2.7%), 9 technicians (1.65%), 5 pharmacists (0.9%), 1(0.2%) nutritionist, and 8 (1.5%) other jobs (Table 1).
Scores of the aspects of patient safety culture are shown in Table 2.

Table 1. Professional characteristics of the participants

Work Experience in hospital (year)	Qazvin (n=200)	Tehran (n=312)	Alborz (n=40)	Total (n=552)
< 1 year	27.1	11.6	17.5	17.6
1-5 years	22.6	28.6	40.0	27.3
6-10 years	17.6	12.9	7.5	14.2
11-15 years	15.1	19.3	7.5	16.9
16-20 years	11.1	18.0	15.0	15.3
>= 21 years	6.5	9.6	12.5	8.7
Work Experience in current unit (year)				
< 1 year	23.6	21.5	15.0	21.8
1-5 years	35.7	43.1	35.0	39.8
6-10 years	22.1	16.4	17.5	18.5
11-15 years	10.1	7.7	12.5	8.9
16-20 years	6.5	5.5	12.5	6.4
>= 21 years	2.0	5.8	7.5	4.5
Average working hours per week (hour)				
< 20 hours per week	2.5	4.5	.0	3.5
20- 39 hours per week	18.7	26.5	20.0	23.2
40 - 59 hours per week	46.5	45.6	60.0	47.0
60 - 79 hours per week	28.3	15.2	17.5	20.1
80 - 99 hours per week	2.5	3.2	2.5	2.9
> 100 hours per week	1.5	4.9	.0	3.3
Position				
Nurse chartered	46.0	62.5	20.0	53.3
Practical nurse / health workers	4.0	9.7	22.5	8.6
BS / technician operating room	7.1	4.5	7.5	5.7
Specialist full time	2.0	.3	12.5	1.8
Physician / Resident	9.6	2.3	.0	4.8
Pharmacist	2.5	.0	.0	.9
Dietitian	.5	.0	.0	.2
Speech /hearing-assessment/ therapy	.5	4.5	.0	2.7
Technicians	21.7	10.4	37.5	16.5
Management	4.0	4.5	.0	4.0
Other	2.0	1.3	.0	1.5
How to interact with patients				
Have direct interaction or contact with patients	90.9	91.7	97.5	91.8
Haven't direct interaction or contact with patients	9.1	8.3	2.5	8.2

"Organizational learning" had the highest scores of positive answers (71.18%). "Handoffs & Transitions" had the lowest scores (54.49%). Differences in the hospitals score were statistically significant in "Teamwork within Units"(p= 0.006), "Manager expectations & actions' (p= 0.014), "Organizational learning and continuous improvement" (p= 0.001), "Management support" (p= 0.007), 'Feedback and communication" (p=0.012), and "Communication openness" (p= 0.003).

Scores of "Teamwork within Units" were highest in Alborz province (69%) and lowest in Tehran (64.83%). The same was true for scores of "Manager Expectations

and actions" and "organizational learning and continuous improvement", (73.50% and 69.58% for "Manager Expectations & actions" and 74% and 69.31% for "organizational learning and continuous improvement", respectively). Qazvin province had the highest score in "Management support' (65.33%), whereas Tehran had the lowest (62.28%).

Moreover, Qazvin had the highest scores in "Overall perceptions of patient's safety" (64.22%), "Feedback and communication"(69.50%), and "Communication openness"(64.80%). The lowest scores of these variables were from Alborz (62.78%), Tehran (65.78%), and Alborz (58.50%), respectively. The highest and lowest scores of

"Teamwork across Units" were from Tehran (61.65%) and Alborz (59.62%), respectively. Scores of "Situation of Staffing"were highest in Qazvin (63%) and lowest in Tehran (61.34%). Scores of "Hospital and transitions" were 53.80% and 55% in Qazvin and Tehran, respectively. Qazvin had the highest score in "Non-punitive response to error" (68.43%), while Alborz had the lowest (64.83%). No statistically significant difference was found between the provinces in overall score of patient safety culture (p= 0.457).

As shown in Graph 1, frequencies of reports of adverse events were highest in Alborz (60.17%) and lowest in Qazvin (53.07%) (Figure1).

Overall, there were no report in 72%, one or two report(s) in 18.8%, 3-5 reports in 7.1%, and 6-10 reports in 2.2% of the studied cases. ANOVA test showed a statistically significant correlation between the frequency of reports of adverse events and score of patient safety culture (p= 0.004). However, there was no difference in frequencies of reports of adverse events between the provinces (p= 0.073, Table 3).

Scores of patient safety were in the acceptable range of 65.5%, 54.8%, and 40% of the studied hospitals of Qazvin, Tehran, and Alborz, respectively T 4);

Table 2. Comparison of average positive responses to patient safety culture factors of HSOPS among provinces

Patient Safety Culture Dimension	Qazvin (n=200)	Tehran (n=312)	Alborz (n=40)	Total (n=552)	Test result
Teamwork within Units	67.02±10.90	64.84±14.78	69±13.92	65.93±13.48	0.006
Management expectations	72.95±10.86	69.58±15.18	73.5±15.61	71.09±13.89	0.014
Organization learning	73.53±11.18	69.31±14.58	74±9.99	71.18±13.29	0.001
Management support	65.33±8.89	62.28±11.45	63.83±12.44	63.5±10.75	0.007
Overall perceptions of safety	64.22±9.16	62.11±11.31	62.87±10.25	62.93±10.53	0.071
Feedback and communication	69.5±11.29	65.87±14.73	68.33±15.07	67.36±13.70	0.012
Communication openness	64.8±9.62	62.07±13.19	58.5±13.03	62.8±12.11	0.003
Frequency of event reporting	53.06±17.62	56.69±17.20	60.17±18.82	55.63±17.57	0.061
Teamwork across Units	60.03±8.35	61.65±9.47	59.63±10.34	60.91±9.17	0.078
Staffing	63±9.55	61.35±13.24	62.87±9.80	62.06±11.8	0.063
Hospital and transitions	53.8±12.77	55±14.7	54±13.5	54.50±13.93	0.068
Non-punitive response to error	68.43±17.03	65.1±17.27	64.83±17.80	66.2±17.34	0.074

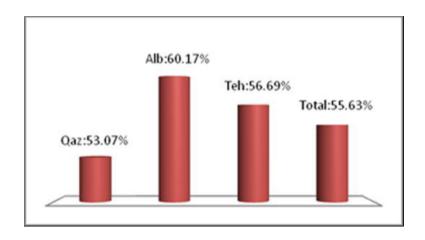**Figure 1.** The reported incidence of the separate studied provinces

Table 3. Comparison of the number of events reported during the previous 12 months

	Qazvin (n=190)	Tehran (n=271)	Alborz (n=35)	Total (n=496)
No event	77.4	69.0	65.7	72.0
1 to 2 events	16.8	19.9	20.0	18.8
3 to 5 events	3.2	9.2	11.4	7.1
More than 6 events	2.6	1.8	2.9	2.2

Table 4. Comparison of the responses to single-item outcome variable 'Patient Safety Grade'

Safety Grade	Alborz (n=40)		Tehran (n=312)		Qazvin (n=200)		Total (n=552)	
Patient	n	%	n	%	n	%	n	%
Failing	12	6	28	9	5	12.5	45	8.2
Poor	35	17.5	46	14.7	11	27.5	92	16.7
Acceptable	131	65.6	171	54.8	16	40	318	57.6
Very good	16	8	49	15.7	5	12.5	70	12.7
Excellent	6	30	18	5.8	3	7.5	27	4.9

Also, the difference was statistically significant, as Chi-square test showed. Likewise, there were statistically significant differences between patient safety in the studied provinces (p=0.016). There was no significant correlation between the score of patient safety and frequency of report of adverse event (p> 0.05). Likewise statistical analysis showed a significant relationship between the patients' safety culture and patients' safety grade (p=0.001).

Discussion

Health care organization has increasingly acknowledged the role of organizational culture change in improvement of the patient's safety. Progressive attention in safety culture has been associated with the needs for assessment tool, especially for attempts in improvement of patient's safety(11). 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 (2).

The present study concentrated on the cultural aspect of patient's safety. This approach had been selected by others, as well(21). We evaluated the patient safety culture in teaching hospitals of central part of Iran using HSOPSC questionnaire. It provided a view to patient safety culture in the studied provinces, as well as Iran as a whole.

Most of the study participants were nurses, like other related studies(22). Nurses play a key role in improvement of patient safety culture (23). Their perception and attitude toward safety is an important part of the patient safety culture (24).

The present study showed that the studied hospital have moderate level of patient safety culture. It is concordant with the result of other studies performed in Iran(25). However, another study has reported an acceptable level of patient safety culture in Iran (23). On the other hand, the participants of the study conducted by Liu have perceived a high degree of unsafe care (26). Study of Chen has suggested that hospital workers of Taiwan have positive feelings toward their patient safety culture (2). Fujita (2013) believes that patient safety culture varies among different countries and each country must pay attention to its own related factor that affects the patient safety culture according to its cultural background (27).

In the current study, "Organization learning" showed the highest proportion of positive responses (71.18%), while "Handoffs & Transitions" was the lowest (54.49%). In the study of Abdiin in Iran (2013), scores of all 10 aspects of patient safety culture and two aspects of consequences of patient safety culture were low to moderate. Amongst them, "Non-punitive response to error" and "Teamwork across units" had the lowest scores (17.8% and 18.2%, respectively) and teamwork in the units obtained the highest (47.2%) (28). In the study of Izad i(2013), "Manager expectations & actions" took the highest score (76%) and positive response of workers was the lowest (48%) (23). Interestingly, teamwork within the units obtained high scores in many HSOPC studies conducted in China (2, 26). However, in the present study, this aspect showed the highest score in Alborz and the lowest in Tehran. It can be concluded that "Teamwork within units" has emerged as an area of strength in almost all HSOPC studies, including the present one.

Participants of the present study revealed excellent safety score of their own unit in 4.9%, acceptable in 57.6%, and weak in 4.9%. In the study of Liu (2013), 20% of the responders gave a very weak score to safety of their own unit while in a study conducted in the United States, 65% of the responders gave excellent or very good scores to safety of their own unit (29). The related score was 44% in a study conducted in Turkey. The safety score of the present study was lower than those of the United States and Turkey(30).

In the current study, there was no report of error in 72%, one or two report(s) in 18.8%, 3-5 reports in 7.1%, and 6-10 reports in 2.2%. There was no report in 67.4% within the last 12 months, one or two report(s) in 21.4%, and more than 3 reports in 11%(26).

The present study showed that patient safety culture is correlated with the number of reports of errors. Wang has suggested that side effects decreases with improvement of patient safety culture (31).

Results of the current study confirmed that Iranian hospitals have moderatestatus in patient safety culture and there is no significant difference between them. Status of patient safety culture in our teaching hospitals is weaker than that of other countries. So, designing some interventions to improve patient safety culture is recommended (25). However, organizational learning has an acceptable status in Iranian hospitals. Safety-based attempts and support of responsible authorities may lead to upgrading of patient safety culture.

Conclusion

Managers' promise to safety as a systemic responsibility and presence of patient safety culture create a safe hospital. Knowledge about the weak and strong points of safety allows the hospitals to improve their patient safety more effectively. Teamwork within units is known as the most strong point of patient safety culture in most related studies, but not in the present study. It should

be strengthened in the workers by appropriate efforts. Response of the workers to errors, hospital transports, and presence of a system for reports of errors should also be noted.

A safe hospital warrants changes in beliefs, values and behavior of the workers in accordance with the patient safety culture as a main change in the hospital. Organizational culture and education play a central role in this regard.

Competing interests

The authors declare that they have no competing interests.

Limitations

There were no limitations to collecting information.

Acknowledgments

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