Patient Safety & Quality Improvement Journal
http://psj.mums.ac.ir
PSQI

Patient Safety Culture Assessment of a Hospital in Tehran: A Case Study

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ARTICLEINFO

Article type:
Original Article

***Article History*:**
Received: 09-Jun-2021
Accepted: 27-Nov-2021

Key words:
Clinical Staff, Hospital, HSOPS Questionnaire, Patient Safety, Patient Safety Culture

ABSTRACT

Introduction:
Evaluating a hospital's patient safety culture (PSC) increases awareness of the various aspects of patient safety. Due to the critical role of PSC, the current study was designed and conducted to assess the level of PSC from the perspective of medical staff.

Materials and Methods:
A descriptive-analytical study was conducted in one of Tehran's hospitals in 2017. A total of 122 participants were selected as the research population from hospital clinical staff using stratified random sampling. The data collection method was a standard HSOPS questionnaire. The data were analyzed descriptively and analytically using SPSS19 software, including the T-test, analysis of variance, and Friedman test.

Results:
The most studied populations were women (80.33%), and nursing staff (54.92%), the average serving years in hospital was (9/42±1/45).The mean score for PSC was 3.41, significantly higher than the national average. Among the various aspects of PSC, the highest and lowest scores were for "managers' expectations and actions regarding patient safety" and "openness of communication channels," respectively.

Conclusion:
According to the findings, the PSC among hospital staff is generally positive and high, which may be a result of the hospital's efforts to establish accreditation standards in the hospital. It is recommended that the hospital management team place a premium on open communication channels, teamwork, organizational learning, information exchange and transmission, communication and error feedback for all medical staff. Additionally, for effective learning, it is recommended to clearly define the process of encouraging and punishing to motivate, continuously assess patient safety status, provide timely feedback on results.

► ***Please cite this paper as:***
*Tahmazi Aghdam E, Nafar H, Aghaei Hashchin A, Abbasi Chaleshari A, *Salehi S. Patient Safety Culture Assessment of a Hospital in Tehran: A Case Study*. Journal of Patient Safety and Quality Improvement. *2021; 9(4): 225-234.*
Doi: 10.22038/PSJ.2021.57876.1327

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Introduction

The importance of health as a fundamental right is undeniable, and without quality requirements, it is impossible to achieve the goals of health services (1). Quality and its various facets in health care are complex and multidimensional, and there is little agreement on defining them (2). On the other hand, patient safety is universally recognized as the most critical aspect of patient care quality (3). In other words, patient safety is a critical component of the quality of health services, which means avoiding harm to the patient while providing health care (4). Following the publication of the Institute of Medicine's (IOM) 1999 report on the prevalence of clinical errors, the issue of patient safety received increased attention (5). According to statistics, patient care is unsatisfactory (6), and the rate of patient injuries resulting from errors is exceptionally high (7). There is evidence that a significant proportion of patients have been complicated while receiving services (8,3) and that between 30% and 70% of these complications are preventable (9). Clinical errors threaten the health system in every country, and their prevalence is also high (10). The World Health Organization (WHO) estimates that clinical errors result in the death or disability of tens of millions of people each year (11).

Clinical errors are among the top ten causes of death in the US health system, accounting for 100,000 deaths each year (12). Thus, in order to promote and improve the quality of health services, patient safety is a top priority for all countries' health systems (13,5); because clinical errors not only result in financial losses for health centers, families, and the community but also reduce efficiency and deteriorate the community's health status (14). To this end, assessing patient safety and identifying scalable points can be highly beneficial. According to studies, more than 90% of accidents are caused by human error, necessitating the establishment of a positive and effective culture among employees and enacting laws and regulations (15). A patient safety culture in medical centers is one of the most influential factors in improving patient safety levels (16). Patient safety culture reflects the importance placed on employees working in medical centers adhering to patient care safety guidelines (17), preventing systemic errors, and increasing patient safety (18). Promoting a patient safety culture is the most effective way to prevent accidents in developed countries (19). Due to the critical nature of safety culture, several tools have been developed to assess it in various medical settings (20). The "Hospital Survey on Patient Safety Culture" (HSOPSC) was developed in 2004 by the Agency for Healthcare Research and Quality as one of the most appropriate tools for assessing patient safety culture in hospitals (21). Patient safety culture is vital in health care systems (22,23). Numerous studies have been conducted in the United States and other countries on this subject (24, 27). According to studies, in addition to structural interventions, patient safety culture should be promoted to improve patient quality and safety (16).An insufficient understanding of the current situation will result in ineffective solutions and interventions. Assessing the patient safety culture in hospitals increases awareness of various aspects of patient safety and identifies areas of strength and weakness, allowing for the improvement of service and health care quality. As a result of the critical role of safety culture in enhancing patient safety and reducing medical errors, the current study was designed and conducted to assess the level of patient safety culture from the perspective of the medical staff at one of Tehran's hospitals.

Materials and Methods

The current study employed a descriptive-analytical, cross-sectional design conducted in 1396 (2017) in one of Tehran's general and educational hospitals with fewer than 200 active beds and an average occupancy rate of 75%. The research population included all clinical staff members at the hospital, including nurses, physicians, laboratory personnel, and radiologists. There were 520 hospital employees, 122 of whom were selected using stratified random sampling. The questionnaire was distributed to 30% of the staff from various occupational groups, and 122 people responded (Table 1).

Table 1: Distribution of demographic characteristics of participants

Demographic Characteristics	Criterion	Number	Percentage
Gender	male	24	19/67
	female	98	80/33
Age	20-30 y/o	25	20/49
	31-40 y/o	64	52/46
	41-50 y/o	28	22/95
	>50 y/o	5	4/10
Occupational group	midwife	17	13/93
	Nursing staff	67	54/92
	radiologist	16	13/11
	physician	22	18/03
Work shift	Day work	35	28/69
	Night work	2	1/64
	rotational	85	69/67
Education place (university)	No university education	10	8/20
	Azad university	32	26/23
	State university	80	65/57

The present study collected data using the standard questionnaire "Hospital Survey on Patient Safety Culture," referred to as HSOPS. The Agency for Healthcare Research and Quality developed this questionnaire in 2004, and it is a widely used tool for assessing patient safety culture from the perspective of hospital staff. The questionnaire is divided into two sections: the first section contains 42 questions that assess 12 different aspects of patient safety and two critical questions about the hospital's overall state of patient safety. The second section of the questionnaire includes six questions about the occupational group, work unit, work experience in the hospital, work experience in the unit, and work experience in other medical centers. A five-point Likert scale was used in this questionnaire to elicit respondents' opinions on whether they agreed (1: completely disagree and 5: completely agree) or alternated (1: never and 5: always). As a result, if a person selects number three, he or she has picked the average situation, and thus the number three is regarded as the scale of comparison. Additionally, to improve accuracy, this questionnaire includes questions with a positive and negative semantic load, with opposition to questions with a negative semantic load indicating that the situation in question is favorable and acceptable.

In 2011, Moghari et al. translated and localized the questionnaire and approved its content validity and reliability. In this study, the questionnaire was validated using confirmatory factor analysis (CFA), and the Internal Consistency Test was performed using Cronbach's alpha (0.82) and Spearman-Brown Coefficient (0.81) (28). The researchers collected the required data using the HSOPS questionnaire after obtaining the necessary administrative permissions and obtaining consent from the clinical staff. After providing the questionnaire during the data collection phase, the researchers instructed participants to complete it completely and accurately. Following the completion of the questionnaire, the data were entered into SPSS19 software per the questionnaire's design pattern and analyzed using descriptive and analytical statistics.

A t-test and Analysis of Variance (ANOVA) were used to obtain analytical statistics and determine whether there was a significant difference between the areas or the overall status of patient safety. The Friedman test was used to grade the 12 areas of the patient

safety culture assessment from the perspective of medical staff.

Results

The current study enrolled 24 males (19.67%) and 98 females (80.33%). The group of people aged 31-40 years (52.46%) and over 50 years (4.10%) were the largest and smallest groups studied, respectively. The nursing staff, with 67 members (54.92%), and the radiology group, with 16 members (13.11%), had the highest and lowest frequency, respectively. In terms of work shifts, 1.64%, 28.69%, and 69.67% of the study sample were day workers, night workers, or worked rotating shifts, respectively. A university degree was held by 112 (92.80%) of the participants (Table 1).

People with more than ten years of work experience and people with less than one year of work experience accounted for a maximum of 36.86% and a minimum of 4.10% of the participants, respectively. Additionally, 52 employees worked an average of 40-50 hours per week, and 100 employees (81.97%) had previous experience working in other medical centers (Table 2).

Table 2: Work experience and weekly working hours of participants

Variable	Criterion	Number	Percentage	(Mean±SD)
Work experience (in the hospital)	Less than 1 year	5	4	9/42±1/45
	1-5 years	43	35	
	6-10 years	29	24	
	More than 10 years	45	37	
Work experience (in the present unit)	Less than 1 year	20	16	5/03±1/04
	1-5 years	62	51	
	6-10 years	22	18	
	More than 10 years	18	15	
Work experience (in other medical centers)	1-5 years	100	82	3/02±0/78
	6-10 years	11	9	
	More than 10 years	11	9	
Average working hours/week	30-40 hours/week	30	25	46/56±1/50
	40-50 hours/week	52	43	
	50-60 hours/week	40	32	

Using a one-way t-test, the mean score for each of the 12 areas of the patient's safety culture status on a five-point Likert scale and comparison to the average status (number 3) demonstrate that the mean scores for 9 of the 12 areas of the patient's safety culture have a statistically significant difference from the average status (Table 3). Except for organizational learning, where midwifery staff had the highest mean score, nurses had the highest mean score in all other areas of safety culture (P <0.001) (2.95 ± 0.81). Additionally, physicians had the lowest mean score across all fields compared to the other three occupational groups (nurse, midwife, and radiologist). In terms of the mean score for patient safety culture aspects, the midwifery and radiology staff

groups were also positioned between the physician and nurse groups (2.39 ± 0.68). Additionally, the scores for teamwork within organizational units, event reporting frequency, organizational learning, teamwork between organizational units, exchange and information transfer, communication and providing feedback on errors, managers' support for patient safety, and openness of communication channels were lower than average. From the participant's perspective, the scores in four areas of managers' expectations and procedures regarding patient safety, staff issues, lack of punitive response to error occurrence, and general perception of patient safety were in optimal conditions and above-average status (Table 3).

Table 3: General score of each area of 12 areas of patient safety culture in the hospital

Area Number	Area Title	occupational group	Area Score (Mean±SD)	p-value
1	The frequency of event reporting	Nursing staff	3/11±0/53	<0/001
		Para clinic	2/86±0/46	
		physician	2/42±0/29	
2	The general perception of patient safety	Nursing staff	3/42±0/52	0/35
		Para clinic	3/21±0/37	
		physician	2/84±0/49	
3	Managers' expectations and procedures in terms of patient safety	Nursing staff	3/75±0/93	<0/001
		Para clinic	3/59±0/83	
		physician	3/36±0/62	
4	Organizational learning	Nursing staff	2/85±0/42	<0/001
		Para clinic	2/76±0/39	
		physician	2/58±0/27	
5	Teamwork within organizational units	Nursing staff	3/21±0/58	0/95
		Para clinic	3/15±0/53	
		physician	2/42±0/27	
6	The openness of communicational channels	Nursing staff	2/35±0/78	<0/001
		Para clinic	2/22±0/71	
		physician	1/59±0/29	
7	Communication and providing feedback on errors	Nursing staff	2/68±0/61	<0/001
		Para clinic	2/62±0/56	
		physician	2/12±0/26	
8	Lack of punitive response to the error occurrence	Nursing staff	3/21±0/38	0/35
		Para clinic	3/14±0/31	
		physician	2/71±0/19	
9	Staff issues	Nursing staff	3/41±0/88	<0/001
		Para clinic	3/35±0/83	
		physician	3/02±0/53	
10	Managers' support for patient safety	Nursing staff	2/52±0/92	<0/001
		Para clinic	2/41±0/83	
		physician	2/09±0/56	
11	Teamwork between organizational units	Nursing staff	2/84±0/79	<0/001
		Para clinic	2/71±0/72	
		physician	2/39±0/42	
12	Exchange and information transfer	Nursing staff	2/79±0/85	<0/001
		Para clinic	2/62±0/76	
		physician	2/53±0/73	

A separate question was asked regarding the participant's overall assessment of the patient's safety status on the ward or unit in which he or she works and the number of errors reported by each participant. One person gave an excellent rating for the

patient's safety status, while 14 gave the lowest rating or indicated a poor condition, and 6 (4.92%), 70 (38.57%), and 31 (25.41%) indicated that the overall patient safety status in their ward or unit is very good, acceptable, or inappropriate, respectively (Table 4). The majority of error reports were submitted by nursing staff, which can be attributed to two significant factors: first, nursing staff comprise a significant percentage of the treatment staff, and second, their increased communication with patients and, consequently, their exposure to errors. In total, 64.7% of nurses rated the patient's safety as acceptable, and the nursing staff was the only occupational group to report more than 21 errors.

According to the respondents' perspective on the separate HSOPSC questionnaire question about the number of reports about accidents occurring in the unit over the previous year, 12 people (9.84%) had the highest number of error reports (>=21 cases) over the previous year, and 33 people (27.05%) had not reported any errors in the previous year.

The one-way t-test indicated that the overall patient safety status was significant and above average at the 5% level.

However, the variable indicating the number of reported accidents occurring in the unit over the previous year was significant at the 10% level (Table 4).

Table 5: Ranking of the aspects of a patient safety culture based on the score of each aspect

Aspect	Average score	Grade*	chi-square (χ^2)	p-value
Managers' expectations and procedures in terms of patient safety	**9/40**	**1**	**47/54**	**<0/001**
Staff issues	**8/95**	**2**		
Lack of punitive response to the error occurrence	**7/88**	**3**		
The general perception of patient safety	**7/74**	**4**		
Teamwork within organizational units	**7/68**	**5**		
The frequency of event reporting	**6/83**	**6**		
Organizational learning	**6/20**	**7**		
Teamwork between organizational units	**5/55**	**8**		
Exchange and information transfer	**5/32**	**9**		
Communication and providing feedback on errors	**5/01**	**10**		
Managers' support for patient safety	**4/2**	**11**		
The openness of communicational channels	**3/32**	**12**		

When evaluating patient safety culture from the perspective of various occupational groups, the mean of the total scores for nursing staff, paraclinical staff, and physicians was 2.78, 2.74, and 2.90, respectively, which was lower than the average overall score. The analysis of variance revealed a significant difference in how different occupational groups evaluated patient safety culture (p-value = 0/09). In other words, at least two occupational groups demonstrate statistically significant differences in patient safety culture assessment (at a 90% confidence level). Follow-up tests were used to identify and assess these groups accurately, and the results revealed a statistically significant difference in the patient safety culture score between physicians and nursing staff. The statistical test indicated significant differences in how respondents rated the patient safety culture when their average weekly work hours varied (p-value = 0/04). Additionally, the patient safety culture was rated more positively by groups with a longer average workday than by groups with a shorter average workday (Table 6). The statistical analysis revealed no significant difference in the average score of patient safety culture between men and women, the

type of university attended, shift work, hospital work experience, current unit experience, work experience in other medical centers and different age groups; this implies that there is no difference in patient safety culture scores between these groups of independent variables (Table 6).

Table 6: Safety culture assessment status by variables studied

Variable	criterion	(Mean±SD)	Test Statistics	p-value
gender	Male	2/0±82/10	T= -1/17	0/24
	Female	2/0±74/06		
Occupational group	Nursing staff	2/0±78/56	F= -1/80	0/09
	Para clinic	2/0±74/21		
	Physician	2/0±90/15		
Education place (university)	No university education	2/0±85/12	F= -0/14	0/84
	Azad university	2/0±79/10		
	State university	2/0±80/07		
Work shift	Day work	2/0±76/10	F= -0/62	0/34
	Night work	2/0±79/03		
	rotational	2/0±82/06		
Work experience (in the hospital)	Less than 1 year	2/0±80/19	F= -0/91	0/40
	1-5 years	2/0±85/07		
	6-10 years	2/0±82/11		
	More than 10 years	2/0±75/09		
Work experience (in the present unit)	Less than 1 year	2/0±78/10	F= -0/70	0/39
	1-5 years	2/0±84/08		
	6-10 years	2/0±76/10		
	More than 10 years	2/0±76/10		
Work experience(in other medical centers)	1-5 years	2/0±82/06	F= -0/93	0/39
	6-10 years	2/0±73/09		
	More than 10 years	2/0±73/10		
Average working hours/week	30-40 hours/week	2/0±73/07	F= -2/39	0/04
	40-50 hours/week	2/0±83/08		
	50-60 hours/week	2/0±85/09		
Age	20-30 y/o	2/0±87/9	F= -1/51	0/21
	31-40 y/o	2/0±80/07		
	41-50 y/o	2/0±79/11		
	>50 y/o	2/0±60/17		

Discussion

Patient safety is a critical component of service quality, and its maintenance and promotion are inextricably linked to an individual's attitude and perspective and the patient safety culture within service provider organizations (29). Thus, assessing the patient safety culture can serve as a platform for developing strategies to improve patient safety.

The mean score of patient safety culture in this study was 3.41, higher than the mean of the Likert scale, indicating that the level of patient safety culture in the research environment is above average and in good condition. This finding was consistent with the findings of Mostafaei et al. (2017), Mohebbi et al. (2015), and several other studies that reported a high level of patient

safety culture in their study environment (30-34), but not with the findings of other studies conducted in the country that reported a relatively unfavorable patient safety culture situation (7,33,35-39). However, the current study found that the patient safety culture is above average. It is necessary to devote additional resources to promoting the patient safety culture within the hospital to ensure patient safety. According to the study, 27% of respondents indicated that they had not reported an accident in the previous 12 months.

Zaboli et al. found that 69% of respondents and Mostafaei et al. found that 42% of respondents had not reported any errors in the previous year (30, 40).

Numerous other research results indicating a low rate of error reporting are inconsistent with the findings of this study (41, 42). The high reporting rate in this study indicates that hospital staff has a predisposition to report errors, one of which could be the absence of a punitive culture at the hospital, which is a positive. Among the various aspects of patient safety culture, managers' expectations and actions in terms of patient safety received the highest score, while staff issues, a lack of punitive response to errors, general perceptions of patient safety, and teamwork within organizational units all received a score above average, indicating the desirability of these aspects' status. On the other hand, the openness of communication channels received the lowest score, and communication and providing feedback on errors, information exchange, and transfer, and teamwork between organizational units received a score below average.

The present study's low score for the openness of communication channels between staff and hospital managers indicates a defect in the management system, consistent with the findings of another study (29). Furthermore, if the system does not facilitate the reporting of accidents, the frequency with which employees of that organization report errors will decrease; thus, managers can strengthen their commitment to patient safety by encouraging open communication with employees, providing training and organizational learning to identify risks, and emphasizing patient safety as a shared and organizational responsibility.

When the relationship between demographic variables and patient safety culture was examined, no significant and influential relationship was observed between gender, age, place of employment, university attended, work unit, shift and hospital work experience, and patient safety culture. This finding corroborated the findings of Zaroshani (2009) in Qazvin, Rezaei (2018) in Tabriz, and several other studies (29,43). However, there was a significant relationship between occupational groups and average weekly work hours and patient safety culture in the current study, which could be explained by greater experience with patient safety and safety culture. Moreover, Rezaei et al. (2018), Haghighi et al. (2014), and Jahangiri et al. (2015) found a significant relationship between occupational groups and average weekly working hours and patient safety culture in their studies (29, 32, 44).

Evaluating the hospital's patient safety culture, which has been in an acceptable position in reporting clinical errors and adhering to patient safety standards, is the project's strength. On the other hand, the participants included a cross-section of medical staff, including physicians, nurses, and paraclinical staff, whose perspectives as the primary members of the diagnosis and treatment teams can be beneficial in terms of intervention efficiency and effectiveness.

Conclusion

According to the findings of this study, the patient safety culture among hospital staff is generally positive and high, which may be a result of the hospital's efforts to establish accreditation standards in the hospital. However, to maintain and improve safety, continuous planning and monitoring are required to achieve a higher level.

According to the findings of this assessment, it is recommended that the hospital management team place a premium on open communication channels, teamwork, organizational learning, information exchange, and transmission, communication and error feedback for all medical staff, and measures such as continuous programmed and intrusive

rounds, face-to-face interviews with staff about patient safety, pursuing challenges to gain staff trust and incentivizing staff performance on patient safety aspects. Furthermore, for effective learning, it is recommended to clearly define the process of encouraging and punishing to motivate, continuously assess patient safety status, provide timely feedback on results, and share experiences. Careful planning and management support for patient safety are also necessary to entice all treatment groups, particularly medical staff, to participate in this initiative. Physicians play a critical role in providing hospital services and can thus improve teamwork and communication. Additionally, they have a significant impact on patient safety culture.

Acknowledgments

The authors deem it necessary to express their gratitude to the participants in the research, the managers, and the medical staff at the hospital under consideration for their extensive cooperation.

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