Investigating the Patient Safety Culture and its Predictive Factors in a Hospital in Iran

Abstract

Aim: This study aimed to assess the patient safety culture (PSC) and its predictive factors in healthcare providers (HCPs) working in a hospital in Iran.

Methods: In this cross-sectional study, 250 HCPs in the hospital were recruited by convenience sampling. Data were gathered by Hospital Survey of Patient Safety Culture Questionnaire (HSOPSC) included 42 items and 12 dimensions of safety culture. Data analysis was performed by SPSS-19, as well as using descriptive and inferential statistics.

Findings: The overall level of safety culture of HCPs was moderate (3.17%). The highest and lowest PSC observed by healthcare providers were in the dimensions of teamwork between organisational units (65.9%) and organisational learning (13.42%), respectively. There was a significant relationship between the total score of PSC with the variables of sex, age, and type of shift ($P < 0.05$).

Conclusion: Considering the moderate level of the PSC of the HCPs, it seems necessary to develop organizational policies to improve the knowledge of them by some strategies like continuing education and establishing a committee of safety culture.

Keywords: Patient safety, safety culture, health care providers, care quality, care

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Introduction

Patient safety is the main component of service quality in healthcare organizations (1, 2). Moreover, it is one of the most outstanding indicators of the quality control of health services (3). Patient safety and quality of care as two inseparable components are special indicators related to the competence of healthcare professionals and patient satisfaction (4). Safety culture as a global challenge of health has a key role in patient safety (5). PSC is a set of social and professional beliefs, norms, motivations, patterns, and functions that reduce the exposure of employees, managers, clients, and the general public to harmful situations (6). In a hospital with a favourable safety culture, nurses can express their opinions freely and in a timely manner in cases where an accident might happen due to systemic problems or human factors. But in hospitals with an unfavorable safety culture, healthcare providers cannot freely express their opinions, which may harm the patient in the process (7).

There are different statistics on the incidence of events due to patient safety problems. Studies revealed that 2.9-16.6% of patients in acute care units experienced at least one injurious occasion, while 50% of these cases were preventable (8). Despite increasing efforts to take the initiative in implementing patient safety programs around the world, patient injury is still the fourteenth leading cause of death (9). The World Health Organization (WHO) announced that 42.7 million adverse healthcare events occur worldwide each year (10). According to WHO, for every 100 hospitalized patients, 7 in developed countries and 10 in developing countries were affected by healthcare-related infections, while they were preventable by 50% by taking simple measures like observing hand hygiene, and wearing the right clothes, hats, and glasses. A suitable safety culture is needed to comply with these issues (3).

A strong safety culture promotes the patient's safety, better outcomes of patient treatment, and increased quality of health care services. Conversely, the low and unfavorable state of safety culture in hospitals leads to undesirable consequences for patients and imposes heavy costs on hospitals (9, 11, 12). Findings of studies have also shown that the development of safety culture and increasing awareness of concepts related to a safe atmosphere of workplace are associated with increased medical error reporting, reduction of harmful events (3, 13).

The development of a safety culture requires considering its twelve dimensions, which include the frequency of events reported, overall perceptions of patient safety, supervisor/manager expectations and actions promoting patient safety, organizational learning/continuous improvement, teamwork across units, communication openness, feedback and communication about error, non-punitive response to errors, staffing, management support for patient safety, teamwork within units, and handoffs and transitions. Different studies have shown varied conditions of these dimensions in

countries (1, 14, 15). Some studies were conducted on a single group of nurses and physicians, and few studies looked at the health care team. As the investigation of safety culture dimensions shows, safety culture should be considered in a team.

It has been shown by literature that hospital safety culture can be influenced by various factors such as age, gender, marital status, educational status, type of work shift, work experiments, employment situation, job position, and weekly average of work hours (16, 17). The impact of these factors varies in different populations and needs to be investigated, While the studies done in this area are few. Considering the importance of maintaining patient safety, the lack of studies in the field of teamwork, and the need to examine the drivers in safety culture, this study was conducted to assess the patient safety culture (PSC) and its predictive factors in healthcare providers (HCPs) working in a hospital in Iran.

Materials and Methods

This cross-sectional study was performed in a hospital in Khuzestan province in Iran (2020).

The research environment was all the hospital units, including emergency, internal medicine, pediatrics, gynecology, surgery, maternity, hemodialysis, psychiatry, operating room, intensive care unit (ICU), and cardiac care unit (CCU).

Sampling was conducted by census method. The participants were all 250 HCPs with different job categories including nurses, the head of the hospital safety committee, the technician of the safety committee, the clinical supervisor, the educational supervisor, the infection control supervisor, the Matron, the respiratory therapist/anesthesiologist, physiotherapist, the responsible for education, the assistant of infection control, the assistant of patient safety, the servitors, the assistant nurses, and the pharmacist.

The criteria for entering the study were working in the health service team at the time of the study and willingness to participate in the research. The criterion for exiting the study was leaving the hospital system for any reason, including leaving job, resignation and vacation during the time of data collection, and work experience of less than 6 months.

The Hospital Survey on Patient Safety Culture (HSOPSC) was used to gather the data. It was developed originally by the American Agency for Healthcare Research and Quality (AHRQ) in 2004. This 42-item questionnaire measures safety culture in 12 dimensions consisting of supervisor/manager expectations and actions promoting patient safety (4 items), organizational learning/continuous improvement (3 items), teamwork within units (4 items), open communication openness (3 items), feedback and communication about error (3 items), non-punitive response to errors (3 items), staffing (4 items), management support for patient safety (3 items), teamwork across units (4 items), overall perceptions of patient safety (3 items), handoffs and transitions (4 items), frequency of events reported (4 items) (18). The questionnaire includes two items asking the participants to rate the patient safety in their workplace (from inappropriate=1 to excellent=5) and to represent the frequency of events they reported over the past 12 months. In Iran, in a study by Moghri et al. (2012), HSOPSC were assessed in terms of the psychometric properties and validation, which obtained values of 14.25, 0.96 and 0.98 for the fitness function (FF), goodness of fitness index (GFI) and adjusted goodness of fitness index (AGFI), respectively. Therefore, the model had a very good fitness. Internal consistency for all items was acceptable. Moreover, Cronbach's alpha coefficient was 0.86. Based on these properties, HSOPSC is a valid scale to assess patient safety culture in Iran (19).

The positive response rate (PRR) was calculated for each item and dimension. An average of the total positivity rate for each item is considered as the item's positivity rate. Furthermore, the dimension's positivity rate was computed by averaging the positivity rate of all items included in the dimension. The 12 dimensions were considered in three levels of strong, requiring improvement, and neutral based on PRR including more than 75%, 50%-75%, and less than 50% respectively. Also, the general level of PSC less than 50% is defined as weak, 51-75% as acceptable, and more than 75% as desirable (20). Additional questions related to demographic and job characteristics (age, gender, marital status, educational status, type of work shift, work experiments, employment situation, job position, and weekly average of work hours) were added to HSOPSC to determine the relation of them with PSC of the participants.

To gather data, the researcher (ZM), in all shifts (morning, evening, night) referred to the units and handed in the questionnaires to the participants. They were requested to complete the questionnaire within 24 hours. This part lasted about two weeks.

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The data were analyzed using SPSS software version 19. Descriptive analysis (e.g. mean, standard deviation, frequency, and percentage) was used to describe the demographic and professional characteristics and results related to the two last questions about the overall grade of patients' safety culture and the frequency of events reported over the past 12 months.
Different inferential analysis methods consisting of Pearson correlation coefficient, one-way analysis of variance (ANOVA) test, Exploratory Factor Analysis, and multiple linear regression were used to examine the relationship between PSC and probable predictors. The significance level was considered less than 0.05.
Ethical approval was obtained from the ethics committee of Lorestan University of Medical Sciences (Code: IR.LUMS.REC.1393.203). Approval to do the study was gained from the hospital manager. Informed written consent was attained from the participants by providing them with information about the study's aims and methods. Moreover, they were ensured of the confidentiality of their data and to be secured in terms of their careers and job positions. To observe the participant's anonymity, there was no need to mention their name in the questionnaire.

Findings

Participants' Characteristics

A total of 250 questionnaires fully completed were returned. The Mean age of the participants was 34.63 ±6.25 years. The characteristics of the participants are reported in Table 1.

The Dimensions and the Items of PSC

According to Table 2, a total of 12 dimensions of PSC had a positivity rating of less than 50% which revealed all of them required improvement. In the dimension of "frequency of events reported" with a positivity rate of 33.8%, the highest percentage of positivity was related to the item "If a mistake is made, is caught and corrected before affecting the patient" (35.8%). Other results are mentioned in Table 2.

Association between PSC and its dimensions with demographic and professional characteristics in HCPs

Pearson correlation test showed that age ($r = 0.15$, $p = 0.016$) and work experience in the hospital ($r = 0.18$, $p = 0.005$) were positively associated with the patient's safety culture.
Multiple linear regression analysis using the step-wise method to enter the variables of age, gender, marital status, educational level, work experience, type of shift, and employment status) revealed that gender, age, and type of shift had a significant effect on the overall score of PSC.
The effect of gender, age, and type of shift on the total score of safety culture was significant so with the adjustments of the variables, the mean score of the total safety culture of nurses was moderate 5.5 units less than that of females ($p=0.008$). Also, by adjusting other variables, the mean total score of nurses with rotating shifts was 43.4 points lower than nurses with fixed shifts. Moreover, for each year of increase in the age of nurses, the total score of their safety culture increased by 0.24 on average, which was statistically significant.
Next, to perform factorial analysis, the results of the value (KMO=0.833) and Bartlett's test ($p<0.001$) indicated the number of samples required for analysis. In Exploratory Factor Analysis (EFA), three factors explained approximately 55.5% of the variation which was 32.47% for the first factor, 13.42% for the second factor, and 9.65% for the third factor. The first factors include subscales of general understanding, organizational learning, teamwork within units, openness of communication channels, communicating and providing feedback, and management support for patient safety. The second factor included subscales of non-punitive response expectations and issues related to staffing and exchange and information transfer, and the third factor included the subscale of error reporting frequency and teamwork between organizational units. To this end, factor scores were calculated for the three discovered factors and placed into equal categories (poor, average, and good) for each factor based on the scores.
The results of the generalized linear model (cumulative ratio) showed that the effect of gender and education on the level of factor 1 was significant so the chance of being in its high levels is 5.2 times higher for females than for males($p=0.019$). Also, in terms of education, the chance of being placed in the high levels of factor 1 is 15.2 times higher for nurses with a bachelor's degree than for nurses with a degree higher than a bachelor's degree ($p=0.049$). The effect of other variables on the levels of factor 1 was not significant ($p>0.05$). At the level of factor 2, the only influential variable was working experience in the special care department ($p=0.019$). So for each additional year of work

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experience in this sector, the chance of being placed in higher levels was 0.08 higher, which was statistically significant. At the levels of factor 3, only employment status was significant.
Based on univariate analysis, female nurses had a higher PSC than men (p = 0.009). Nurses with fixed shifts had a higher PSC than nurses with rotating shifts (p = 0.004). In terms of the type of employment status, the mean score of PSC of nurses with permanent employment was significantly higher than nurses with conventional employment (P = 0.006) Table 3.
Regarding the outcome variables (items), 35.6% of the participants reported moderate patient safety in their units. Moreover, 35.6% claimed that they had not seen any episodes in their work unit in 12 months. Other results are mentioned in Table 4.

Discussion

This study investigated the PSC in a general hospital in Khuzestan, in Iran. Evaluating the PSC level is the beginning of developing the PSC in an organization. Moreover, providing care safe without sufficient information about the situation may lead to increased costs and expose the organization to risks (5).
In the present study, the overall positive response rate for all of the dimensions of the HSOPSC revealed that the hospital had moderate patient safety which means it was in need of improvements. The results are favorable to the findings of studies by Jabarkhil in Afghanistan (11, 21-23). In these studies, PSC was at an average level. Despite the difference in time, place, and environmental conditions of their studies, similar results were obtained. Due to the importance of PSC in the hospital environment, paying attention to its improvement can be the basis for improving care services. Also improving PSC in hospitals is a great alteration that requires changing the values, beliefs, and behavior of employees in line with the values of safety culture which should be supported by senior managers and leaders (24). Fostering the safety culture of the hospital is an important development and requires changing the values, beliefs, and behaviors of the organization's staff in line with the values of the safety culture (25).
Based on the results, in terms of the positive response rate of the dimensions, the highest percentage was associated with the dimension of "teamwork within units" (33.9%) and the lowest was related to the dimension of "Staffing" (7.3%). In the studies by Kapaki and Souliotis in Greek and Mohi Eldin et al in Egypt, it was found that "teamwork within units" had a positive influence on promoting PSC (26, 27). The study by Pourshareiati in Iran, which showed the necessity of the continuation of the implementation of learning programs and continuous improvement of safety in the hospital, is concordant with the present study (8). The results of studies conducted in different countries showed that they had a high average score in the dimension of "teamwork within units" (28, 29). Indeed, based on the dimension of "teamwork within units", employees in a situation support each other and work together as a team to tackle problems (30). Due to the importance of safety and its priority in hospital accreditation programs, it is necessary to periodically assess the PSC of the staff and to improve the level of PSC by modifying the weaknesses. More emphasis should be placed on teamwork to improve PSC. Alsabri et al. (2020) examined the influence of teamwork on PSC in a systematic review. They reported that effective teamwork interventions can increase the outcome of PSC at Kirkpatrick's Level Four and improve patient and community health (31).
This study revealed that one of the dimensions that were important in explaining the PSC was "management support for patient safety", which people in this study got high average scores (0.53). It should be noted that the results are consistent with some studies and inconsistent with others. So, in a study by Mohi Eldin et al., management support had a positive effect on patient safety (27). However, the results of the studies by Arshadi Bostanabad in Iran, and Kapaki showed there was no relation between management support and improving the PSC (26, 30). The possible explanation for the differences might be due to the differences in organizational atmosphere and management's behavior. Xie et al. (2017) reported that better managerial visibility into PSC can have many implications for patient health. In a study, it was revealed that an attitudinal intervention for managers reduced the number of patients who fell out of bed and suffered pressure ulcers (32). A change in managerial perspective leads to the correct alignment of the healthcare system and their supportive perspective accelerates the safety culture.
In the study, the other dimension which was important in explaining the PSC was "frequency of events reported", which people in this study got high average scores. The findings of studies of Mohi Eldin in Egypt. and Bodur and Filiz in Turkey (33), Arshadi Bostanabad and Pourshareiati in Iran (8, 27, 34) and Bari et al. in Pakistan (10) which showed the lack of effect of frequency of incident

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reporting in promoting PSC in the hospitals under study. This issue is very effective in increasing PSC and subsequent planning. Of course, this conclusion depends on the context of this organization. Error reporting can be the result of the high organizational culture in that organization. Also, in advanced degrees, learning, and progressive organizations show the way to solve problems and institutionalize the culture of self-improvement.

In this study, the dimension of "handoffs and transitions" was important to explain the PSC, which people in this study got high average scores. This was in concordant with finding from studies by Kapaki and Souliotis (26) while it differed from the results of the studies by Pourshareiati (8) in Iran, Jabarkhil (22) in Afghanistan ,and Mohebi-far (34). Transferring patient information (from one caregiver or therapist to the next person) in the right way can prevent care and treatment errors, so paying attention to this issue will be effective in increasing PSC (13).

The study findings showed the lowest positive response rate was associated with three dimensions of "non-punitive response to errors", "staffing" and "handoffs and transitions". This result is concordant with the studies by Chen et al., and Pourshareiati et al (8, 28). Thus, if the culture of non-punitive response to error is higher, the rate of error reporting also increases. Therefore, it is necessary to improve the safety culture.

In the present study, the staff issues had a low average. In line with the study, in the studies of Chen et al., and Pourshareiati et al., staff-related issues was the weakest component which may be due to the insufficient skills of staff to provide care to the patients which increases possibility of errors (8, 28). Also, the lack of a highly motivated workforce is one of the biggest challenges that hospitals are faced (35).

There was a significant positive correlation between PSC and age, and hospital work experience. The studies of Haghighi et al. in Tehran hospitals (36), Heidari in Arak (37), and Arghami (38) supported these findings. The study of Zaroshani in the operating room of Qazvin hospitals did not show any significant relationship with age, sex, and level of education (39). Personal and organizational characteristics of healthcare workers can be directly related to PSC. Age and work experience are the strongest of these characteristics in this study and contribute to it. A person with great experience has a broader view. However, it is the responsibility of the organization to transfer this comprehensive perspective to new employees as quickly as possible. Competence development courses for people with more or less professional experience are helpful for this. This topic can be considered as one of the main areas of professional development (40).

Conclusion

The present study showed that the PSC in the hospital was lower than the standard. The highest and lowest scores of PSC were associated with the dimensions of "teamwork within units" and "staffing", respectively. There was a relation between the PSC and some demographic and professional characteristics including age, sex, and type of shift. All hospitals should strive to present themselves as patient-friendly hospitals by making progress the patient safety. It seems that improving communication openness and teamwork as well as paying more attention to systemic and organizational factors can help improve patient safety. Moreover, continuously evaluating hospitals in terms of PSC to modify the weaknesses and educational interventions for managers and healthcare professionals might be influential in promoting PSC and patient safety. It is suggested that holding educational workshops might be influential in raising the level of awareness of healthcare providers and managers about PSC.

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