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Evidence on the Patient Safety Culture and Nursing Work Environment in Iran

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ABSTRACT

Introduction: Patient safety is a universal concern with numerous gaps requiring research. Nurses are the largest workforce in healthcare system and play a pivotal role in the profitability and patient safety indices in hospitals. The present study aimed to evaluate the perception of nurses toward the patient safety culture and nursing work environment in Iran.

Materials and Methods: This cross-sectional study was conducted on 100 nurses in Khoy, located in West Azerbaijan, Iran. Data were collected using the hospital survey on patient safety culture (HSPSC), which was completed by the participants during July 1st-30th 2017. Data analysis was performed in SPSS version 19.

Results: Positive response rate was 7-82% for 42 items in the HSPSC. The highest positive response rate was in the item "When one area in the ward becomes very busy, others help out." (82%), whereas the lowest rate was in the item "We have enough staff to handle the workload." (7%). In addition, the lowest positive response rate belonged to the dimension of 'staffing' (21%), while the highest rate belonged to the dimension of 'teamwork within units' (76%).

Conclusion: According to the results, nurses had a positive perception toward teamwork. However, they believed that the number of the staff to manage the workload was insufficient and occasionally caused poor interactions among the staff. As an external quality evaluation tool, accreditation could be applied to develop the patient safety culture. Therefore, further investigation is recommended regarding the influence of hospital accreditation on the patient safety culture in Iran.

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Introduction

Patient safety has been an increasingly vital subject of interest over the past decade despite the numerous gaps requiring research. Patient safety is a universal concern affecting all countries. The World Health Organization (WHO) has emphasized on the importance of patient safety and the associated issues; therefore, it is necessary to improve the knowledge of the main collaborative factors to find suitable solutions in this regard (1).

Many patients are affected by preventable injuries during healthcare procedures in hospitals, and several deaths are reported due to medical errors each year (2, 3). The most common medical errors include medication errors, inefficient communication, infections, falls, pressure ulcers, surgical errors, and treatment errors, which may be preventable by healthcare professionals, especially nurses (4, 5).

For nurses to properly evaluate the quality and safety of care, they must be able to assess the health care outcomes resulting from the work environment, as well as the care structures and processes (6, 7).

As a result, nurses will be enabled to recognize and ameliorate the consequences of their care delivery and identify the trends and causal factors, thereby improving their job satisfaction by proving the value of their services to themselves, their managers, and the community (8, 9).

Nurses are the largest pioneer workforce in hospitals; therefore, organizational profitability remarkably depends on their decisions, which influence patient

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safety indices (10). Moreover, nurses are in a key position to improve the quality of care through patient safety interventions and strategies. In various settings, the most vital nursing cooperation in patient safety is the ability to coordinate and integrate multiple aspects of quality within care provision as directly provided by nurses and other staffs across clinical environments (11, 12). The environment of nursing practice impacts the quality and safety of care provision. In 2009, WHO released a report that proposed prioritized research on organizational environments in an attempt to identify the failures or gaps that might compromise patient safety in several developing countries (13).

In Iran, which is a developing country, nurses constitute approximately 80% of the employers in healthcare settings and are directly involved in first-line patient care. Nurses also play a pivotal role in preserving patient security and safety. Therefore, awareness of the perceptions of these healthcare providers toward patient safety could enhance this aspect of care, as well as patient satisfaction (14).

Despite the priority of patient safety, discussions on the factors that interfere with proper patient safety are rather recent.

In the national and international literature, there are consistent recommendations, particularly to hospitals, regarding the nursing work environment, emphasizing that nurses and effective care contribute to rapid patient recovery (14, 15).

In addition, other studies have pointed out that favorable nursing practice environments could remarkably improve patient safety and quality of care (16), thereby enhancing the safety climate and reducing the occurrence of adverse events (17).

According to the findings in Iran (2011), all the dimensions of the patient safety culture require meticulous improvement (18).

With this background in mind, there is a wide gap in the dimensions of patient safety and nursing work environment in the healthcare system of Iran.

The foundations of accreditation were laid by the Iranian Ministry of Health and Education (2007) in regard to the patient safety culture and work environment, and the service standards of evaluations were determined. These standards were developed in number and structure in time and put into practice in various versions.

However, there are no valid statistical data on the pitfalls of patient safety in Iran, and several studies have denoted that these issues mainly occur due to the structural weaknesses in the healthcare system. In this regard, the increasing rate of complaints and dissatisfaction among patients and their family could provide reliable evidence (19).

The present study aimed to evaluate the perceptions of the nurses in two general hospitals toward the accreditation certificate regarding the patient safety culture and nursing work environment.

Materials and Methods

This cross-sectional study was conducted in two general hospitals covered by the accreditation certificate supervision of the Iranian Ministry of Health in Khoy, located in West Azerbaijan, Iran. Sample population consisted of 100 nurses employed in various wards of the selected general hospitals.

Data collection was performed through selecting the participants via simple random sampling. The researchers distributed the questionnaires among the nurses in the hospitals, answered their questions, and collected the completed questionnaires. In order to meet the confidentiality principles of the hospitals, the personal information of the participants were not included in the questionnaires. The study protocol was approved by the Ethics Committee of Urmia University of Medical Sciences Ethical, and the researchers obtained the required permit for data collection in the healthcare facilities.

Data Collection Tool

Data collection tool was the hospital survey on patient safety culture (HSPSC) developed by the Agency for Healthcare Research and Quality (AHRQ) in the United States in 2004. HSPSC consisted of 12 dimensions and 42 items, which were scored based on a five-point Likert scale (1=Strongly Disagree, 5=Strongly Agree).

The last section of the survey included two extended items, requiring the respondents to provide an overall grade on the level of patient safety in their workplace and mention the number of the reported events within the past 12 months. HSPSC has been translated into Persian, and its psychometric properties have been determined, with the Cronbach's alpha estimated at 0.74 for all the items.

The other data collection tool in the present study was the revised nursing work index (NWI-R) to assess the work environment of nurses. NWI-R was composed of the dimensions of 'autonomy', 'control over the work environment', 'nursing team-physician interactions', and 'organizational support' in 15 items, which were scored based on a four-point Likert scale (1=Strongly Agree, 4=Strongly Disagree) within a score range of 1-4, and low scores indicated a better the work environment (20). NWI-R was translated into Persian and culturally adapted to the Iranian population by the researchers in the present study. In addition, the validity and reliability of NWI-R were confirmed (α=0.69-0.87).

Data Collection

Initially, the nursing managers in the selected hospitals were informed on the concepts of the survey and objectives of the study. Following that, they were assured of the confidentiality of the collected data. After obtaining written informed consent from the participants, they cooperated in the data collection process. Of note, some nurses did not complete the

survey due to lack of interest or tiredness. Data collection was performed during July 1st-30th 2017.

Data Analysis

Data analysis was performed in SPSS version 19. Positive responses were defined as "Agree", "Strongly Agree", "Always", and "Most of the Time", and the negative items were reverse-coded. After estimating the mean values of the items in the questionnaires, the total scores of the dimensions (n=12) were determined as well.

The Kolmogorov-Smirnov test was used to analyze the scores of the dimensions in the questionnaires and assess their normal distribution.

In addition, the dimensions were investigated separately in terms of four independent variables, including the working hours in the hospital, hospital unit, and job and weekly working hours. According to the Kolmogorov-Smirnov test, the scores of the dimensions were distributed normally in terms of the weekly working hours only (P>0.05).

Results

Professional History of Nurses

In total, 100 nurses employed in the general wards of the selected hospitals were enrolled in the study, and the response rate was 85%. Among the participants, 92% were female, and 8% were male, who were in direct interaction with patients. Professional history of the nurses is presented in Table 1.

Table1: Frequency Distribution of Professional History of Nurses

Professional History		N	%
Work Experience in Hospital (year)	<1	23	23
	1-5	31	31
	6-10	17	17
	11-15	13	13
	16-20	11	11
	≥21	5	5
Work Experience in Wards (year)	<1	27	27
	1-5	43	43
	6-10	19	19
	≥11	11	11
Overall Nursing Experience	<1	7	7
	1-5	41	41
	6-10	12	12
	11-15	15	15
	16-20	13	13
	≥21	12	12
Weekly Working Hours	40-59	50	71
	60-79	20	29

According to the results, the positive response rate was 7-82% for the items of the HSPSC.

The highest positive response rate was in the item "When one area in the ward becomes very busy, others help out." (82%), whereas the lowest rate was in the item "We have enough staff to handle the workload." (7%). In addition, the positive response rate in the 12 dimensions of the patient safety culture was 21-76% (table 2). The lowest positive response rate belonged to the dimension of 'staffing' (21%), while the highest rate belonged to the dimension of 'teamwork within units' (76%).

The average positive response rate of the patient safety dimensions was 58%, while the response rate of five dimensions was below average, including 'supervisor/manager expectations and actions promoting patients safety', 'communication openness', 'teamwork areas in units', 'staffing', and 'non- punitive response to errors'.

Using Chi-square, the correlations of the scores obtained in the patient safety dimensions with the working hours of the nurses in the hospital, hospital units, and weekly working hours were assessed separately (Table 2).

The results indicated no significant differences in the patient safety culture dimensions in terms of the working hours in the hospital, hospital units, and weekly working hours of the nurses (P>0.05).

The AHRQ published the HSPSC 2004 in order to evaluate the safety culture in hospitals across the world.

In 2006, the organization funded the development of a comparative database as a response to the requests from the hospitals engaged in comparing their safety culture survey results with those of other hospitals in other countries.

The database includes the data of the hospitals participating in the research voluntarily, which serve as an important resource for hospitals in terms of supporting the patient safety culture. These comparative database reports were prepared during 2007-2014 (19).

According to the reports published by the AHRQ, the professionals completing the HSPSC are mainly nurses, physicians, administrative hospital staff, technicians, therapists, pharmacists, and other staff directly or indirectly contributing to care service provision.

According to the research conducted by the AHRQ in 2011, the positive response rates for the items on the patient safety culture were 35-86%.

Furthermore, the results demonstrated that the highest positive response rate belonged to the items "People support each other in this ward." (86%) and "When a lot of work needs to be done quickly, we work together as a team to get the work done." (86%).

On the other hand, the lowest rate of positive responses belonged to the item "Staff may worry that their mistakes will persist in their personal life." (35%).

In the present study, the rate of positive responses was 21-76% in the dimensions of the patient safety culture.

The highest positive response rate belonged to the item "When one area in the ward becomes very busy, others help out." (82%), and the average positive response rate in the mentioned dimensions was 58%.

Table2: Positive Response Rate of Patient Safety Culture Dimensions

	AHRQ*	SH**
A. Teamwork within Units	80	76
A1. Healthcare team members support each other in the ward.	86	78
A3. When there is heavy workload and insufficient time, we work together as a team to do the work.	86	74
A4. In this ward, the healthcare team members and staff treat each other with respect.	78	72
A11. When one area in the ward becomes very busy, others help out.	69	82
2. Supervisor/Manager Expectations and Actions Promoting Patients Safety	75	54
B1. My supervisor/manager admires good work in words.	73	49
B2. My supervisor/manager seriously considers the suggestions of the staff to improve patient safety.	77	63
B3. Whenever pressure builds up, my supervisor/manager would like to work faster.	74	29
B4. My supervisor/manager overlooks the patient safety problems that occur repeatedly.***	76	68
3. Organizational Learning/Continuous Improvement	72	63
A6. We actively attempt to improve patient safety.	84	61
A9. Mistakes have led to positive changes here.	64	58
A13. After we make changes to improve patient safety, we evaluate their effectiveness.	69	74
4. Management Support for Patient Safety	72	66
F1. Hospital management provides a work climate that promotes patient safety.	81	79
F8. The actions of the hospital management show that patient safety is a top priority.	75	67
F9. Hospital management seems interested in patient safety only after an adverse event occurs.***	61	63
5. Overall Perceptions toward Patient Safety	66	72
A10. It is only by chance that more serious mistakes do not occur around here.***	62	67
A15. Patient safety is never sacrificed to get more work done.	65	79
A17. We have patient safety problems in this unit.***	65	71
A18. Our procedures and systems are good at preventing errors.	72	65
6. Feedback and Communication about Errors	64	69
C1. We are provided with feedback about the changes put into place based on event reports.	56	51
C3. We are informed on the errors that occur in this unit.	65	74
C5. In this unit, we discuss the approaches to prevent repeated errors.	71	77
7. Frequency of Events Reported	63	69
D1. How often is a mistake, which is spotted and corrected before affecting the patient, reported?	56	58
D2. How often is a mistake that causes no potential harm to the patient reported?	59	60
D3. How often is a mistake that could harm the patient reported?	74	79
8. Communication Openness	62	55
C2. Staff will freely speak up if they see something that may negatively affect patient care.	76	80
C4. Staff will free to question the decisions or actions of the authorities.	47	31
C6. Staff may be afraid to ask questions when something seems wrong.***	63	54
9. Teamwork Areas in Units	58	54
F2. Hospital units do not coordinate well with each other.***	46	47
F4. There is proper cooperation among the hospital units that need to cooperate.	59	71
F6. It is often unpleasant to work with the staff from the other hospital units.***	59	33
F10. Hospital units work well together to provide optimal patient care.	68	70
10. Staffing	57	21
A2. We have enough staff to handle the workload.	56	7
A5. Staff in this unit work longer than is best for patient care.***	53	9
A7. We use more agency staff than is best for patient care.***	67	52
A14. We work in the "crisis mode" attempting to do too much too quickly.***	50	18
11. Handoffs and Transitions	45	67
F3. Things are "full between the cracks" when transferring patients from one unit to the other.***	41	67
F5. Important patient care information is often lost during shift changes.***	50	80
F7. Problems often occur while exchanging information across hospital units.***	43	54
F11. Shift changes are problematic for the patients in this hospital.***	45	77
12. Non-Punitive Response to Errors	44	33
A8. Staff may believe that their mistakes are being held against them.***	50	31
A12. When an error is reported, it may seem like the person is being written up.***	46	46
A16. Staff may worry that their mistakes persist in their personal life.***	35	33

*Agency for Healthcare Research and Quality (2011) user comparative database report data (20);
**Studies hospital: data from a private hospital with Joint Commission International accreditation certificate in Turkey;
***Reverse item

With respect to the perceptions of nurses toward patient safety in their units, our findings indicated that although 78% of the lowest positive response rate belonged to the dimension of 'non-punitive response to errors' (44%), while the nurses considered the level of patient safety to be excellent or very good. Moreover, the perceptions of nurses toward the level of patient safety were evaluated separately based on four independent variables, and no statistically significant difference was observed in this regard (P>0.05).

Similarly, in the AHRQ study (2011), 29% of the samples considered the level of patient safety to be excellent or very good in their units.

Evaluation of the number of the reported events in the present study indicated that 58% of the nurses did not report any adverse events.

Consistently, the AHRQ study (2011) indicated that more than half of the samples (54%) did not report any events.

The number of the reported events was evaluated separately based on four independent variables, and 44% of the nurses with the work experience of 1-5 years and 11% of those with the work experience of ≥11 years reported 1-2 events. Furthermore, a statistically significant difference was observed in the working hours of the nurses in the hospitals in this regard (P=0.01).

In the assessment of the work environment, the scores of all the dimensions were lower than 2.5. With regard to the level of patient safety, only the dimension of 'job satisfaction' had higher scores than 75. The perceptions of the nurses toward the work environment and safety attitudes are presented in tables 3 and 4.

Table3: Mean Scores of Dimensions of Revised Nursing Work Index

Dimension	Mean	Standard Deviation
Revised Nursing Work Index		
Nursing Team/Physician Interactions	1.82	0.62
Autonomy	1.92	0.56
Organizational Support	2.03	0.46
Control over the Work Environment	2.06	0.46

Table4: Mean Scores of Safety Attitudes Questionnaire-Short Form (2006)

Safety Attitudes Questionnaire-Short Form (2006)	Mean	Standard Deviation
Job Satisfaction	72.42	18.20
Teamwork Climate	62.32	20.32
Safety Climate	62.85	12.32
Stress Recognition	62.61	12.30
Working Conditions	60.24	21.22
Perception of Hospital Management	55.24	16.51
Perception of Unit Management	53.82	16.31

Discussion

Studies on the patient safety culture are commonly used outside of the United States, where the principles regarding the patient safety culture were developed. Several studies have used the tools to assess the status of the patient safety culture in the hospitals in various countries, such as Argentina, Australia, Bahrain, Belgium, Columbia, France, India, Greece, Germany, Mexico, the Netherlands, Portugal, Ireland, Saudi Arabia, Scotland, Serbia, Peru, Singapore, Spain, Sweden, Taiwan, Turkey, the United Kingdom (21), and Iran (22).

Recently, an increasing number of studies have assessed the patient safety culture in Iran, which have been performed in private, general, and teaching hospitals. However, none of these studies have evaluated the patient safety culture in a general hospital with the Joint Commission Index (JCI) accreditation certificate and in terms of the nursing workplace in Iran as a developing country. The present study is considered unique in this regard and is expected to add new data to the current literature of the patient safety culture.

To meet the objectives of the current research, the researchers used the HSPSC. The psychometric properties of the Persian version of this survey have been examined by Maghari (20), with confirmed validity and reliability. In total, 105 surveys were completed by our participants, and the responses of 100 participants were considered valid. The average rate of positive responses for the dimensions of HSPSC was 58%.

The highest rate of positive responses was observed in the dimension of 'teamwork within units' in our research and the study by the AHRQ (2011). The following dimensions in this regard were the 'overall perceptions of patient safety', 'communication and feedback about errors', and 'frequency of events reported', respectively. Similarly, 'teamwork within units' has been reported to have the highest rate of positive responses in the studies carried out on physicians, nurses, and other hospital staff in Lebanon, Taiwan, New Zealand, Spain (21), Iran (22), and Gambia, as well as those conducted on the physicians and nurses in Sweden and nurses in Oman (21).

In Taiwan, the rate of positive responses in the dimension of 'teamwork within units' was reported to be 94%. The other dimensions with high positive response rates were 'organizational learning-continuous improvement' and 'supervisor/manager expectations and actions promoting patient safety' in the studies conducted in the aforementioned countries.

According to the current research, the highest positive response rates belonged to the dimensions of 'teamwork within units' (76%), 'overall perceptions of patient safety' (72%), 'communication and feedback about errors' (69%), and 'frequency of events reported' (69%).

Therefore, it could be concluded that the JCI accreditation positively influenced the perceptions of the hospital staff toward patient safety and their errors in order to decrease the rate of medical incidents.

According to the present study, the dimensions of 'staffing' and 'non-punitive response to errors' had the lowest positive response rates, while the AHRQ reported the lowest rate of positive responses in the dimension of 'handoffs and transitions'. In this regard, our findings are consistent with the results of the previous studies in Lebanon, Taiwan, New Zealand (21), Iran (22), and Gambia (21). In addition, the dimensions with the lowest positive response rates were only reported from the perspective of nurses in the studies in Oman, Saudi Arabia, and Croatia (23).

In the current research, the positive response rate in the dimension of 'staffing' was 21%, while it was reported to be 15% in Saudi Arabia, which is lower compared to the findings in other countries. This could be due to the negative effects of factors such as the low funding rate for staffing, increased number of patients in wards, and accreditation procedures leading to increased workload. In the present study, 68% of the participants graded the patient safety level as favorable. This rate was reported to be 75% in the AHRQ study, 59% in Sweden, and 52% in Gambia. On the other hand, 8% of the participants graded the patient safety level in their units as poor. This rate was reported to be 3% in Lebanon, 5% in Sweden and the AHRQ study (2011), and 12% in Lebanon and Gambia.

In a study performed on nurses in the United States and 12 European countries (Belgium, England, Finland, Greece, Ireland, the Netherlands, Norway, Germany, Spain, Sweden, and Switzerland), 6% of the nurses in the United States rated the patient safety level as poor, while this rate was reported to be 18% and 17% in the viewpoint of the nurses in Poland and Greece, respectively (17).

According to the results of the present study regarding the number of the reported events, 53% of the participants stated that no events were reported within the past 12 months. This rate was estimated at 33%, 57%, and 68% in Sweden, Lebanon, and Gambia, respectively. Moreover, the AHRQ reported this rate to be 54% in 2011. As such, the events threatening patient safety should definitely be reported in order to establish the patient safety culture in healthcare institutions. In the studies performed in the aforementioned countries (with the exception of Sweden), the rate of unreported events was more than 50%, which could be due to the concerns of the healthcare staff about reprimands, losing their job, alienation from colleagues, and encountering litigation. In the present study, the nurses with less work experience nurses reported more events compared to others. Therefore, it could be inferred that senior nurses were more concerned about the adverse consequences of event reporting.

Another objective of the current research was to assess the status of nursing work environment and nursing safety attitudes. With regard to nursing work environment, the highest mean score belonged to the dimension of 'control over the work environment' (2.06±0.46), and the lowest mean score belonged to the dimension of 'nurse/physician interactions' (1.82±0.62). As for the nursing safety attitudes in the hospitals, the dimension of 'job satisfaction' had the highest mean score (72.42±18.20), and the dimension of 'perceptions of unit management' had the lowest mean score (53.82±16.31). These findings are moderately consistent with the patient safety culture measurement results.

According to the current research, hospital supervisors and managers had limited experience and actions about patient safety, while the majority of the nurses had more control over the work environment comparatively. In addition, nurses who worked with an altruistic approach in the delivery of nursing services to the community faced challenges such as funding issues, insufficient staff, and low payment; nevertheless, they had higher job satisfaction compared to the other nursing staff. One of the limitations of the present study was that we only assessed the viewpoints of nursing professionals toward patient safety. Furthermore, the study was only carried out in general hospital wards and no critical care units, and comparisons were made between two working areas under variable circumstances. Therefore, it is recommended that further investigation be conducted in other hospitals and critical care units with accreditation certificates in order to thoroughly determine the influence of hospital accreditation on the patient safety culture in Iran.

Conclusion

Consistent with the previous studies on the patient safety culture, our findings indicated that nurses had a positive perception toward teamwork; however, they believed that the number of the staff to manage the workload was insufficient, and this issue often led to poor interactions of nurses and physicians in wards. As an external quality evaluation tool in health services, accreditation could remarkably contribute to the development of the patient safety culture. According to the studies conducted on nurses in various countries, attention must be paid to the problems associated with patient safety in order to improve this aspect of health care. According to the results, the patient safety dimensions of 'staffing', 'non-punitive response to errors', 'teamwork areas in units', 'teamwork within units', and 'supervisor/manager expectations and actions promoting patients safety' needed to be addressed for the improvement of the patient safety culture. In order to enhance the patient safety culture, the quality and quantity of the staff should be adequate in proportion to the workload in hospital units. Since the heavy workload and low job satisfaction due to insufficient number of nurses might lead to medical errors, healthcare institutions should provide services with sufficient nursing staff in accordance with their

needs. In addition, the working hours of nurses should be balanced, and nursing shifts should be regulated based on the fact that excess working hours may decrease the productivity of nurses and lead to errors inevitably. In the case of errors, the incidents should be associated with the 'the system', and necessary precautions should be taken so as to prevent error recurrence instead of reproaching nurses.

Managers of healthcare systems should appreciate nurses in establishing patient safety procedures and consider their suggestions in this regard in order to improve patient safety. On the other hand, nurses must enhance their communication skills and collaborate with other units harmonically. Harmonic interactions could potentially prevent many medical and nursing errors and enhance patient safety. Moreover, healthcare delivery systems should consider the patient safety culture at certain intervals to increase the awareness of the staff regarding the patient safety culture, thereby identifying the weaknesses of the system. Despite the accumulating knowledge about patient safety, the optimal level has not been achieved yet, and the damages resulting from medical errors remain a significant issue in the provision of healthcare services.

Therefore, it is of paramount importance to conduct further investigation on the perceptions of healthcare staff toward the patient safety culture so as to increase the quality of healthcare service and share the relevant information across countries, which will ultimately improve patient safety.

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