JQRHS

Journal of
Qualitative Research in Health Sciences

https://jqr1.kmu.ac.ir
doi:10.34172/jqr.1522
J Qual Res Health Sci 2026;15:1522

Original Article



# Strategies for Improving the Implementation of Patient Safety-Friendly Hospital Standards in Iran: A Mixed Methods Study

**Mahmood Nekoeimoghadam[1], Mohammadreza Amiresmaeili[2], Reza Kazemi[3], Mohammadreza Tavakoli[4*]**

[1]Health in Disasters and Emergencies Research Center, Institute for Future Studies in Health, Kerman University of Medical Sciences, Kerman, Iran
[2]Health Services Management, Health Services Management Research Center, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran
[3]Department of Urology, Al-Zahra Hospital, Isfahan University of Medical Sciences, Isfahan, Iran
[4]Health Services Management, Al-Zahra Hospital, Isfahan University of Medical Sciences, Isfahan, Iran

*Corresponding Author: Mohammadreza Tavakoli, Email: tvk.mohammadrezaa@gmail.com

**Abstract**

**Introduction:** The implementation of a set of patient safety standards in hospitals is part of the patient safety-friendly hospitals program. By putting these standards into practice, hospitals can be sure that patient safety is regarded as a high priority and that all staff members strive to achieve this aim. The purpose of this research was to investigate ways to enhance the implementation of patient safety-friendly hospital standards in Iranian hospitals.

**Methods:** This study was conducted using a sequential explanatory mixed method. The strategies for improving patient safety-friendly hospital standards were first identified through the use of a qualitative study, and then they were approved or rejected by the experts through the use of the fuzzy Delphi method in two stages. Based on this, 20 interviews were conducted, and no interviews were excluded. Finally, 800 minutes of interviews were conducted virtually through the virtual classes of Kerman University of Medical Sciences in 2022. A semi-structured interview was used to collect data. The existing data were categorized, and the dimensions, guiding principles, and constituent parts pertinent to the research topic were extracted using qualitative analysis software such as MaxQDA version 2020.

**Results:** In this study, 30 main issues were identified as ways to improve the application of hospital standards that are patient safety-friendly; one issue was eliminated based on expert opinion, and 29 major issues were approved.

**Conclusion:** To improve the quality of services provided and better implement patient safety standards in centers, the solutions presented in this study should be implemented and can be considered as an implementation model for evaluating mandatory patient safety standards.

**Keywords:** Patient safety, Criteria, Hospital, Standards of care

**Citation:** Nekoeimoghadam M, Amiresmaeili M, Kazemi R, Tavakoli M. Strategies for improving the implementation of patient safety-friendly hospital standards in Iran: A mixed methods study. J Qual Res Health Sci 2026;15:1522. doi:10.34172/jqr.1522

**Received**: January 18, 2025, **Accepted:** May 9, 2025, **ePublished:** February 7, 2026

## Introduction

Hospital facilities are essential pillars of the healthcare system in any nation, providing access to diagnosis, care, and treatment for people from all walks of life (1). In addition to the roles already mentioned, hospitals also serve a very significant symbolic role for the general public that demonstrates the welfare state of communities (2). Organizations that provide healthcare services have recently had to contend with the challenge of enhancing safety and raising quality (3). Recently, the focus on quality in healthcare has shifted from simply focusing on the care's content to focusing on the provision and administration of services. Most countries in the World the world today strive to effectively manage their organizations' capacities and cut costs overall (4). Patients suffer injuries of varying severity in 10% of hospital admissions on average, according to research studies (5), and 75% of these mistakes are thought to be preventable. Unsafe medical treatment and other medical services not only cause human suffering, but they also have high financial costs. In fact, non-safety clinical services that harm patients are thought to be responsible for five to ten percent of health-related costs, and among these, the failure of systems and routines accounts for a greater portion of the cost than the role of persons (6). Unsafe medical care is a problem that affects health care systems worldwide. This can have several negative effects, including high rates of morbidity and mortality and a detrimental impact on hospitals' performance (7, 8).

Governments in both developed and developing

countries are attempting to achieve a suitable level of safety in hospitals in this regard (5, 9). Patient safety has been given paramount importance by the World Health Organization (WHO) as a matter of public health (10). The implementation of a set of patient safety standards in hospitals is part of the patient safety-friendly hospitals program. By putting these standards into practice, hospitals can be sure that patient safety is regarded as a high priority and that all staff members strive to achieve this aim. Providing a secure environment for patients and, as a result, safeguarding society from avoidable injuries will be the primary objectives of the program to improve the standards for patient safety in hospitals (11). Establishment of clinical governance, the development of patient safety-friendly hospitals, and the accreditation of hospitals based on codified standards are just a few of the significant efforts that have been made in our country over the past few years to improve patient safety and the standard of healthcare services. The first step in implementing mandatory patient safety standards, which are being implemented in all hospitals across the country at levels one, two, and three in the form of accreditation, is to create a plan for patient safety-friendly hospitals (12). Patient safety standards are essential for the implementation of the patient safety program at the hospital level (13). Although statistics of medical errors related to patient safety have not been published in Iran, due to the increase in patients' complaints against doctors, their cases have been referred to the medical system organization. The occurrence of such incidents in the health system of the country can be considered serious (13), or the fact that nurses made 19.5% of medication errors in a period of three months (14 ). By avoiding these mistakes, the patient's safety is largely guaranteed. Patient safety is defined as keeping the patient safe from any negative and harmful events while receiving medical services (16,17). Hospital transfers were also among the weakest areas in patient safety in Iranian hospitals, and compliance with physical space standards was effective in the inpatient safety performance of nursing staff. The first phase of the patient safety program in Iran is to achieve the standards required to enter the patient safety-friendly hospital program. Considering that a comprehensive study regarding the evaluation of these standards in Iran's hospitals has not been conducted since the beginning of mandatory patient safety standards, or if it was a part of the hospital or the patient safety culture, the patient's safety situation needed to be subjected to a comprehensive review. By fostering communication between experts (executives, planners, researchers, and expert professors), this study aimed to improve the implementation of patient safety-friendly hospital standards in Iran and also identified practical solutions for better implementation of these standards (1).

## Methods

This study was conducted using a sequential explanatory mixed method in January 2021 and lasted for 15 months. Due to the use of both quantitative and qualitative methods, it can provide desirable and acceptable results and expand the depth and scope of the research, compensate for weaknesses, obtain stronger interpretations, and explain the findings. The strategies for improving patient safety-friendly hospital standards were first identified through a qualitative study, and then they were approved or rejected by the experts using the fuzzy Delphi method. The qualitative aspect of the study was the contractual content analysis. A structured interview was used to collect data. The study population participating in this stage included the hospital president and director, patient safety coordinator expert, quality improvement manager and expert, university professors with executive work experience involved in the patient safety program, people with long-term management experience in various hospital departments, people with long-term experience in the university and in the health system, and experts and officials from the vice-president of treatment and the health system who are involved in the patient safety program. The sampling was carried out through purposive sampling; in other words, people who were knowledgeable about the mandatory patient safety standards and had valuable experiences in this field were interviewed. Given the characteristics of the research, the number of participants depends on the saturation of information. Because in qualitative research, unlike quantitative research, importance is given to determining the sample size through statistical calculations, repetition of previous information or repetition of the theme or highlights is a sign of the quality of the sample size. This method was also used in this research. In this study, after preparing an interview guide, all the interviews were conducted. This work was done to increase the accuracy of the work in collecting the findings. The interview guide was based on the opinions of the supervisor and advisor. In this study, the interviews were recorded using a tape recorder. The interviews lasted anywhere from 30 to 60 minutes. Based on this, 20 interviews were conducted, and no interviews were excluded. Finally,800 minutes of interviews were conducted. Due to the coronavirus pandemic at the time, the interviews were conducted virtually through the virtual classes of Kerman University of Medical Sciences in 2022. The questions of this stage were as follows:1- In your opinion, what are the managerial and clinical challenges of implementing mandatory patient safety standards? 2- In your opinion, what kind of infrastructures are needed in terms of structure, building space, and information technology for better implementation of mandatory patient safety standards? Or what do you suggest? 3- In your opinion, what solutions can be considered for the complete and 100% implementation of mandatory patient safety standards in hospitals? 4- What resources are needed to fully implement mandatory patient safety standards? human resources? financial? equipment resources? To assess the research's validity and reliability, the researcher attempted to improve its credibility by recruiting participants over an extended period of time,

ensuring that they participated adequately, and fostering meaningful interactions with them. This allowed the researcher to collect reliable data, which was then verified by the participants. Along with benefiting from the review by supervisors, consultants, and experts, step-by-step repetition, data collection, and analysis were also carried out to increase the dependability of the data. The university professors' approval and their supplementary comments were used to improve the standard of data confirmability. The participants' quotes were expressed exactly as they were said to develop the transferability of the study's data. Participants in this stage of the study were chosen from among those involved in the patient safety program, including: The head and manager of the hospital, the patient safety coordinator expert, the quality improvement officer and expert, university professors with executive experience involved in the patient safety program, and people with long experience in management in different departments of the hospital. A sampling method was used to identify and access the participants through snowball sampling. Twenty interviews were conducted virtually through Kerman University of Medical Sciences' online classes. Data collection continued until the researcher was certain that there was no chance for the emergence of a new concept. The analysis stages were as follows: In this research, immediately after conducting each interview, the interviews were typed and saved on the computer. The interviews were transcribed on 80 A4 pages. In the next step, the text of the interviews was read and reviewed several times so that the researcher gained sufficient mastery over the data. In the next step, the data were broken into semantic units (code) in the form of sentences and paragraphs related to the main meaning. Semantic units were also reviewed several times, and then appropriate codes were written for each semantic unit. This stage led to the formation of about 800 initial codes and more than 9 main topics. In the next stage, the codes were classified based on conceptual and semantic similarity and were made as small and compact as possible. The process of data degradation in all analysis units and main and sub-classes should flow. Finally, the data were categorized into the main classifications, which are more general and conceptual, and then themes were abstracted, and suggestions were presented.

The existing data were categorized, and the dimensions, guiding principles, and constituent parts pertinent to the research topic were extracted using qualitative analysis software such as MaxQDA version 2020. The data analysis at this stage was based on the conventional content analysis method. Data analysis was done thematically. Thematic analysis is a type of data content analysis that is classified based on topics (18). Then, in the following step, the fuzzy Delphi method was used until theoretical saturation to summarize and use the opinions of major stakeholders and experts in this field. In this method, the final decision regarding the best option was made in accordance with the consequences and criteria, and these decisions were subjected to criticism before being suggested in the form of corrective solutions. The summary of the outputs prepared in the previous stage, which is the tool of this stage, served as the basis for this decision (19). Table 1 presents the results of the first phase of fuzzy Delphi.

In the section of effective factors for promoting and improving the implementation of mandatory patient safety standards and the implementation of patient safety-friendly hospital standards, the factor that obtained a non-phase score of less than 0.7 was targeted.

Preparation of the second-round questionnaire: In this step, based on the results of the analysis of the first-round questionnaire, the second-round questionnaire was prepared. In this stage, the confirmed factors of the first stage of fuzzy Delphi were designed in a new questionnaire and provided to the experts. Also, in this round, the score determined by each expert in the previous stage was also included so that the experts could compare the average value of each factor and be informed about the previous step. In this round, the fuzzy average of calculated points and definite points was calculated in a similar way using defined geometric relations. Other steps of the first round were also repeated for the second round of Delphi, and finally, after completing two rounds, the Delphi process was finished. In the second round of fuzzy Delphi, no factor was removed, and all factors were confirmed, so in this round, the conditions for the termination of the fuzzy Delphi steps were checked, and the difference of the non-fuzzy average of the first and second rounds was less than 0.1, which indicated the termination of the Delphi steps. Two Delphi rounds were conducted in two months.

Twenty-five primary issues related to improving the mandatory standards of patient safety and five main issues related to implementing solutions for the basic and advanced standards were identified based on the thematic analysis carried out in this section.

The result of the second phase of fuzzy Delphi: The first phase's confirmed indicators were designed into a new questionnaire in this phase and given to the experts. Additionally, the final average of the first round was included in this round so that the experts were aware of the average value of each index in the earlier stage. Table 2 presents the results of the fuzzy Delphi's second stage. In this round, relations 1-3 to 3-4 are used to calculate the fuzzy average scores, while relation 5-3 is used to determine the definite scores. No indicators were eliminated during the second round of fuzzy Delphi, and every indicator was confirmed. The criteria for the termination of the fuzzy Delphi steps were therefore assessed in this round, and if the difference of the non-phase average of the first and second rounds was less than 0.1, indicating the end of the Delphi steps. The results are shown in Table 3. According to the table, the fuzzy Delphi is terminated because the results show that the average difference between all criteria is less than 0.1.

## Results

In the analysis of the responses related to the solutions

**Table 1.** The results of the first round of fuzzy Delphi effective factors for promoting and improving the implementation of mandatory patient safety standards and the implementation of patient safety friendly hospital standards

| Criterion | Sub-criterion | Fuzzy score | Non-fuzzy score | Status |
|---|---|---|---|---|
| Strategies to promote and improve the implementation of mandatory patient safety standards | Continuous training of all hospital personnel | (0.615, 0.865, 1) | 0.827 | Confirm |
| | Starting patient safety education from the university | (0.596, 0.846, 0.962) | 0.801 | Confirm |
| | Prioritizing patient safety in strategic planning and the senior managers of the organization | (0.654, 0.904, 1) | 0.853 | Confirm |
| | The existence of a written program for evaluation | (0.577, 0.827, 0.962) | 0.788 | Confirm |
| | Increasing people's awareness of their rights | (0.538, 0.788, 0.923) | 0.750 | Confirm |
| | Prioritization in the field of financial resources | (0.596, 0.846, 0.981) | 0.808 | Confirm |
| | Creating a link between the performance of doctors in the areas of patient safety and receiving benefits | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Receiving the opinions of hospitals in formulating the same executive procedure and specialization of standards | (0.558, 0.808, 0.962) | 0.776 | Confirm |
| | Adequate training for patient safety experts | (0.654, 0.904, 1) | 0.853 | Confirm |
| | Taking preventive measures in patient safety | (0.654, 0.904, 1) | 0.853 | Confirm |
| | Teaching hospital building standards to those in charge of construction | (0.692, 0.942, 1) | 0.878 | Confirm |
| | An active approach and the use of new tools in error identification | (0.673, 0.923, 1) | 0.865 | Confirm |
| | Training managers in the field of quality | (0.615, 0.865, 1) | 0.827 | Confirm |
| | The justification of hospital managers regarding the implementation of patient safety standards | (0.673, 0.923, 1) | 0.865 | Confirm |
| | Criteria for placing patient safety priorities in the removal and installation of managers | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Changing organizational culture to improve patient safety | (0.673, 0.923, 1) | 0.865 | Confirm |
| | Attention to patient safety from the top levels of the Ministry of Home Affairs and the Hospital | (0.712, 0.962, 1) | 0.891 | Confirm |
| | The presence of a university representative in hospital committees | (0.327, 0.577, 0.788) | 0.564 | Reject |
| | Establishing a system of reward, encouragement, and punishment | (0.615, 0.865, 1) | 0.827 | Confirm |
| | Enriching nursing reports instead of documentation | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Inconspicuous monitoring of the implementation of standards | (0.538, 0.788, 0.942) | 0.756 | Confirm |
| | Sharing experiences and skills and using retired forces and ethical people | (0.538, 0.788, 0.923) | 0.750 | Confirm |
| | Creating skills and teamwork in the field of patient safety | (0.692, 0.942, 1) | 0.878 | Confirm |
| | Localization of patient safety standards | (0.558, 0.808, 0.962) | 0.776 | Confirm |
| | Cultivation of patient safety in patients and human resources | (0.635, 0.885, 1) | 0.840 | Confirm |
| Solutions for implementing patient safety friendly hospital standards (basic and advanced standards) | Creating the necessary infrastructure to implement the program | (0.615, 0.865, 1) | 0.827 | Confirm |
| | Positive view of managers and necessary policies in this field and management stability | (0.692, 0.942, 0.981) | 0.872 | Confirm |
| | Improvement in education and culture | (0.635,0.885, 1) | 0.840 | Confirm |
| | Mandating the implementation of basic and advanced standards for implementation | (0.538, 0.788, 0.942) | 0.756 | Confirm |
| | Sufficient funding and financial resources for the implementation of basic and advanced standards | (0.596, 0.846, 0.981) | 0.808 | Confirm |

for implementing mandatory patient safety standards, 25 solutions were extracted, which were finalized using the fuzzy Delphi technique. In the first stage of this method, 15 questionnaires were sent to individuals who were purposefully selected. The number of responses received from this sample was 13. In the next stage of completing the questionnaire, 13 questionnaires were returned from the 13 questionnaires sent. Finally, 1 of the 25 suggested solutions was eliminated, and the remaining 24 options were presented as the final solution as follows:

Twenty-five criteria of solutions were obtained from the analysis of the responses related to the implementation of mandatory patient safety standards, and they were then finalized using the fuzzy Delphi method. The individuals in charge of the construction of hospitals should be instructed in hospital building standards, and errors should be found by taking an active approach and using new tools. "*I think we are weak in terms of education, and the Ministry should make it mandatory that people who want to build hospitals must read several books on building hospitals. In terms of physical space, the Ministry should make it mandatory and provide training for those who are building hospitals to make those books mandatory and provide training on the problems we have in terms of building space*" (Interview No. 8).

Additionally, senior hospital managers should receive quality training, hospital managers should be justified in implementing patient safety standards, and patient safety should take precedence in the selection and dismissal of managers. One participant spoke about the need for managers to be familiar with patient safety concepts. "*The first thing is the awareness and justification of managers. For example, some people come into the management fields who are doctors and have not taken a management course. You are saying that it is a mandatory and basic standard for them to have at least some familiarity with the category*" (Interview No. 6). "*For this concept to be instilled in managers, the selection and appointment of managers must be correct, or we must ask them to have knowledge of hospital standards or at least study them*" (Interview No. 9). One participant raised the issue of training hospital managers and leaders in the area of patient safety.

**Table 2.** The results of the second round of fuzzy Delphi, the effective factors of promoting and improving the implementation of mandatory patient safety standards and the implementation of patient safety-friendly hospital standards

| Criterion | Sub-criterion | Fuzzy score | Non-fuzzy score | Status |
|---|---|---|---|---|
| Strategies to promote and improve the implementation of mandatory patient safety standards | Continuous training of all hospital personnel | (0.615,0.865,1) | 0.827 | Confirm |
| | Starting patient safety education at the university | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Prioritizing patient safety in strategic planning and involving the senior managers of the organization | (0.654,0.904,1) | 0.853 | Confirm |
| | The existence of a written program for evaluation | (0.615,0.865,1) | 0.827 | Confirm |
| | Increasing people's awareness of their rights | (0.615, 0.865, 0.962) | 0.814 | Confirm |
| | Prioritization in the field of financial resources | (0.596, 0.846, 0.981) | 0.808 | Confirm |
| | Creating a link between the performance of doctors in the areas of patient safety and receiving benefits | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Receiving the opinions of hospitals in formulating the same executive procedure and specialization of standards | (0.558, 0.808, 0.962) | 0.776 | Confirm |
| | Adequate training for patient safety experts | (0.673,0.923,1) | 0.865 | Confirm |
| | Taking preventive measures in patient safety | (0.673,0.923,1) | 0.865 | Confirm |
| | Teaching hospital building standards to those in charge of construction | (0.692,0.942,1) | 0.878 | Confirm |
| | An active approach and the use of new tools in error identification | (0.692,0.942,1) | 0.878 | Confirm |
| | Training managers in the field of quality | (0.635,0.885,1) | 0.840 | Confirm |
| | The justification of hospital managers regarding the implementation of patient safety standards | (0.673,0.923,1) | 0.865 | Confirm |
| | Criteria for placing patient safety priorities in the removal and installation of managers | (0.654, 0.904, 0.981) | 0.846 | Confirm |
| | Changing organizational culture to improve patient safety | (0.692,0.942,1) | 0.878 | Confirm |
| | Attention to patient safety from the top levels of the Ministry of Home Affairs and the Hospital | (0.712,0.962,1) | 0.891 | Confirm |
| | Establishing a system of reward and encouragement, and punishment | (0.635,0.885,1) | 0.840 | Confirm |
| | Enriching nursing reports instead of documentation | (0.635, 0.885, 0.981) | 0.833 | Confirm |
| | Inconspicuous monitoring of the implementation of standards | (0.596, 0.846, 0.981) | 0.808 | Confirm |
| | Sharing experiences and skills, and using retired forces and ethical people | (0.558, 0.808, 0.923) | 0.763 | Confirm |
| | Creating skills and teamwork in the field of patient safety | (0.692,0.942,1) | 0.878 | Confirm |
| | Localization of patient safety standards | (0.596, 0.846, 0.981) | 0.808 | Confirm |
| | Cultivation of patient safety in patients and human resources | (0.654,0.904,1) | 0.853 | Confirm |
| Solutions for implementing patient safety-friendly hospital standards (basic and advanced standards) | Creating the necessary infrastructure to implement the program | (0.615, 0.865, 1) | 0.827 | Confirm |
| | Positive view of managers and necessary policies in this field, and management stability | (0.692, 0.942, 0.981) | 0.872 | Confirm |
| | Improvement in education and culture | (0.635, 0.885, 1) | 0.840 | Confirm |
| | Mandating the implementation of basic and advanced standards for implementation | (0.577, 0.827, 0.962) | 0.788 | Confirm |
| | Sufficient funding and financial resources for the implementation of basic and advanced standards | (0.596, 0.846, 0.981) | 0.808 | Confirm |

No indicators were eliminated during the second round of fuzzy Delphi, and every indicator was confirmed. The criteria for the termination of the fuzzy Delphi steps were therefore assessed in this round, and if the difference between the non-fuzzy average of the first and second rounds is less than 0.1, it indicates the termination of the Delphi steps. The results are shown in Table 3. The fuzzy Delphi was ended as the results showed that the average difference across all criteria is less than 0.1.

"*Training managers and leaders in this area is important. Many of our doctors have not been trained in this area and are not very familiar with these standards.*"

At the highest levels of the ministry and hospital, there should be a shift in the organizational culture toward patient safety. Additionally, a system of rewards, encouragement, and punishments should be put in place. Nursing reports should also be improved, unnecessary documentation should be avoided, and standards implementation should be quietly monitored. "*I think the most important thing is the safety culture that needs to be instilled, first in senior managers and then among the staff, and more importantly, management and leadership awareness is also important. And if the Ministry of Health or the Deputy Health Minister puts pressure, it can be effective, and hospitals will move in that direction*" (Interview No. 10). *A reward system can be very helpful. If there is no incentive system, they will not cooperate very much, and this goes back to the budget that should have been allocated for safety, which means, as the saying goes, it should be carefully measured, and you say that someone is going to help us a lot in advancing safety goals, and when we reject their name, they should be given an incentive, and a very, very useful task could be done*" (Interview No. 11). "*But we need to move in this direction so that the nursing report is enriched and the children write exactly what they are doing and don't add forms or things like that and don't look for documentation and don't stray from the original.*

**Table 3.** The difference between the average of the first and second phase of fuzzy Delphi effective factors for promoting and improving the implementation of mandatory patient safety standards and the implementation of patient safety friendly hospital standards

| Criterion | Sub-criterion | First round non-fuzzy score | Second round non-fuzzy score | Difference |
|---|---|---|---|---|
| Strategies to promote and improve the implementation of mandatory patient safety standards | Continuous training of all hospital personnel | 0.827 | 0.827 | 0.000 |
| | Starting patient safety education from the university | 0.801 | 0.833 | 0.032 |
| | Prioritizing patient safety in strategic planning and senior managers of the organization | 0.853 | 0.853 | 0.000 |
| | The existence of a written program for evaluation | 0.788 | 0.827 | 0.038 |
| | Increasing people's awareness of their rights | 0.750 | 0.814 | 0.064 |
| | Prioritization in the field of financial resources | 0.808 | 0.808 | 0.000 |
| | Creating a link between the performance of doctors in the areas of patient safety and receiving benefits | 0.833 | 0.833 | 0.000 |
| | Receiving the opinions of hospitals in formulating the same executive procedure and specialization of standards | 0.776 | 0.776 | 0.000 |
| | Adequate training for patient safety experts | 0.853 | 0.865 | 0.013 |
| | Taking preventive measures in patient safety | 0.853 | 0.865 | 0.013 |
| | Teaching hospital building standards to those in charge of construction | 0.878 | 0.878 | 0.000 |
| | An active approach and the use of new tools in error identification | 0.865 | 0.878 | 0.013 |
| | Training managers in the field of quality | 0.827 | 0.840 | 0.013 |
| | The justification of hospital managers regarding the implementation of patient safety standards | 0.865 | 0.865 | 0.000 |
| | Criteria for placing patient safety priorities in the removal and installation of managers | 0.833 | 0.846 | 0.013 |
| | Changing organizational culture to improve patient safety | 0.865 | 0.878 | 0.013 |
| | Attention to patient safety from the top levels of the Ministry of Home Affairs and the Hospital | 0.891 | 0.891 | 0.000 |
| | Establishing a system of reward and encouragement, and punishment | 0.827 | 0.840 | 0.013 |
| | Enriching nursing reports instead of documentation | 0.833 | 0.833 | 0.000 |
| | Inconspicuous monitoring of the implementation of standards | 0.737 | 0.808 | 0.071 |
| | Sharing experiences and skills and using retired forces and ethical people | 0.750 | 0.763 | 0.013 |
| | Creating skills and teamwork in the field of patient safety | 0.878 | 0.878 | 0.000 |
| | Localization of patient safety standards | 0.776 | 0.808 | 0.032 |
| | Cultivation of patient safety in patients and human resources | 0.840 | 0.853 | 0.013 |
| Solutions for implementing patient safety-friendly hospital standards (basic and advanced standards) | Creating the necessary infrastructure to implement the program | 0.827 | 0.827 | 0.000 |
| | Positive view of managers and necessary policies in this field, and management stability | 0.872 | 0.872 | 0.000 |
| | Improving education and culture | 0.840 | 0.840 | 0.000 |
| | Mandating the implementation of basic and advanced standards for implementation | 0.756 | 0.788 | 0.032 |
| | Sufficient funding and financial resources for the implementation of basic and advanced standards | 0.808 | 0.808 | 0.000 |

*The interview tool is sufficient, or observation is sufficient*" (Interview No. 9). "*They fully comply when the supervisor is above them, and this means that we have high supervision in this area so that we can put this matter behind us, and the supervision must be subtle*" (Interview No. 8).

Retired personnel and creative individuals should be utilized, as well as sharing experiences and skills. "*But there are kids in the treatment line who are really elite, really interested. It's good that when the kids retire, they don't stay away, especially those who are still interested and keep themselves updated. It's very good that those who like to be interested are really educated, it's good that their experiences are used, their knowledge is not wasted.*" (Interview No. 18).

As patient safety standards are implemented, teamwork should be promoted, and skills should be strengthened by implementing patient safety standards. One participant also suggested that building skills in patient safety through training can lead to training others. "*What if they are trained so that they can do it themselves means that I am such a skilled and trained expert in implementing standards that I can train four other people*" (Interview 16). Patient safety standards should be localized to the circumstances of Iranian hospitals, and patient safety should become ingrained in both patients and hospital staff for better standard implementation. Five implementation strategies were obtained from the responses to the analysis of the basic and advanced standards for patient safety-friendly hospitals. The necessary infrastructure should be built to implement the program, To implement basic and advanced standards, managers and policymakers must have a suitable viewpoint on the matter and recognize the importance of managerial stability. There should be better training and cultural development in the area

of putting basic and advanced standards into practice. Additionally, the budget and financial resources for the implementation of basic and advanced standards should be sufficiently provided. The implementation of basic and advanced standards should also be made mandatory. Another participant also spoke about the lack of financial, equipment, and human infrastructure. "*Even the requirements we are implementing cannot provide infrastructure, manpower, and equipment for advanced standards, and there is a problem in terms of budget*" (Interview No. 5). Another participant considered the three elements of vision, will, and budget to be three important factors in implementing these standards. "*I worked in a government that had been working on one model for ten to twelve years, and the last year I came, the model changed. Why? Because a manager who was very important to him in terms of finances and his vision was financial and managerial. The vision of the group's managers has a significant influence on the transfer and making money. Vision, will, and financial discussions must be together*" (Interview No. 15). One of the participants considers the cultural weakness in implementing standards to be an obstacle to implementing basic and advanced standards. "*Because we don't have a very institutionalized patient safety culture, it costs this much right now, then put up yellow and red labels and provide training on what is yellow and what is red, then buy and print the devices, and in the end, it is not used at all in identifying patients. That is, it is the same culture, the same institutionalization and training*" (Interview No. 8).

## Discussion

Obstacles to the implementation of basic and advanced standards were in various areas, including the lack of necessary infrastructure for program implementation, the perspective of managers and policy-making, and the instability of management, weakness in education and culture building, the lack of mandatory implementation of basic and advanced standards, and the cost of implementing basic and advanced standards.

In a study, Mohammadi et al. (2018) concluded that it is essential to manage and control errors in the health system due to their increased sensitivity and wider range of consequences. Therefore, according to the findings of this part of the study, the corrective interventions of the senior managers of the organization seem to be required to develop, maintain, and improve the culture of principled reporting of errors, learning from and sharing the experiences of errors among employees, and finally developing a culture of safety and improving quality (20). Additionally, Amiran et al. (2018) reported that more focus is required on the following issues: promotion of patient safety culture and its observance by the managers and staff of hospital units to improve patient safety; reporting of incidents; improving inter-departmental teamwork; and non-punitive responses to the occurrence of possible errors, which is consistent with the findings of the present study (21). In a similar study, Mehrtak et al. concluded that although the safety status of the studied hospitals is favorable, considering the significance of the issue, planning to achieve higher levels of safety-friendly hospital standards by the studied hospitals should be continuously included on the agenda of hospital managers (22). A study by Mazhari et al. showed that institutionalizing patient safety culture, putting patients at the center of service delivery, training staff and patients, and removing legal barriers all appear to increase the level of compliance with patient safety standards at the national level. Some of these findings are consistent with the findings of the present study (23).

Management and Clinical Challenges:

Among the management and clinical challenges of implementing patient safety standards that participants mentioned were: Change in patient safety priority with change in managers/difference in perspective and attitude- and incomplete training on patient safety standards.

- Lack of patient safety culture

According to the findings of this study, it appears that the review of strategies includes targeted and evidence-based management of organizational resources with a comprehensive approach that includes barriers to the realization of safety dimensions, institutionalization of patient safety culture, and improvement of the environment. According to the study by Haji Babaei et al. in hospitals, patient safety indicators require attention and focus, which is consistent with the findings of the present study (24). In addition, Najafpour et al., in a study, found that the weak points found in the hospitals are the same and that all the hospitals under study are in a weak situation in terms of compliance with the indicators of education and research based on patient safety. According to the findings of the present study, it appears necessary to develop comprehensive educational programs and engage in applied research in the area of patient safety challenges (25). In a study, Rahimi et al. concluded that the patient safety culture in the studied hospitals needs to be improved. Also, the level of errors reporting by employees is very low. Therefore, it is essential to increase the number of staff members, especially nurses, in proportion to the volume of work and the number of patients, cut back on employee work hours, adopt safety-focused and non-punitive culture policies, support staff, and implement efficient training initiatives in hospitals. According to the findings of the present study, Qaraei et al. also concluded that health trustees and hospital managers should set the foundation for enhancing the culture of patient safety and reducing unwanted incidents through methods like training hospital staff and encouraging the reporting of unwanted incidents (26, 27). Consistent with the findings of the present study, Taqvi Larijani et al. also found that the general level of patient safety culture does not have a clear and desirable place in the health system; as a result, more attention and more detailed planning of policy makers and senior managers of the health system are required to remove the barriers to the development of patient safety culture in hospitals (28). The average

attitude toward patient safety among all operating room staff, according to a study by Niknejad et al., does not appear to be ideal. The results of this study are consistent with the findings of the present study, as it shows that hospital managers and staff must implement efficient intervention programs to foster a culture and attitude of patient safety among operating room staff (29).

In the field of education, in a study, Najafpour et al. reported that patient education and participation needed special attention, improving education, creating opportunities to participate in treatment for patients, the commitment of senior managers, changing the attitude of employees, and improving safety. It is suggested that to implement patient safety standards, reliable indicators should be compiled to evaluate the situation and identify patient safety deficiencies in the hospital, and finally to be able to solve the patient safety barriers with a comprehensive goal-setting. Furthermore, participation by staff members and the support of senior managers can both be effective in raising safety standards. The findings consistent with the findings of this section of the research include the importance of including patient safety in the organization's management plans and taking a balanced approach to examining the various facets of the patient safety approach (30, 31).

## Conclusion

Action should be taken to make the implementation of standards as efficient as possible by implementing the solutions offered in this study and achieving the goal of improving the quality of services offered and better implementing patient safety standards in the centers. Before the stages of developing, approving, putting into practice, and establishing standards, attention must be paid to finding solutions. The studied hospitals are in an average situation in terms of compliance with mandatory patient safety standards, but to obtain the title of patient safety-friendly hospital and improve patient safety and prevent their injuries, it is necessary to fulfill 100% of mandatory patient safety standards, which will achieve this goal. It requires the commitment of senior managers, changing the attitude of managers and employees towards patient safety. It is hoped that by institutionalizing the culture of patient safety, putting patients at the center of service delivery, training staff and patients, and removing legal and financial barriers, we will see an increase in compliance with patient safety standards. It is suggested that the hospital patient safety coordinator use the results of this evaluation to implement the opportunities for improvement and to eliminate the weak points raised, and make the necessary follow-up, so that an official audit of these hospitals could achieve the first level of patient safety standards as soon as possible. It is suggested to use up-to-date and modern software and communication technologies and infrastructures to improve the quality of services and implement the standards provided. Practical suggestions are as following:

- To establish international patient safety standards, centers should be guided and encouraged with stronger incentives for international cooperation.
- In evaluating specialized professions and processes, especially those related to the clinic, members of clinical specialty boards, renowned professors with high scientific degrees and ranks, should be used.
- To create a common language among evaluators, practical training courses should be held to eliminate evaluator bias.

## Study limitations

One of the limitations of the study is that some people in the research community were very busy and did not have enough time to conduct interviews. To mitigate this problem, the researcher put enough time and necessary follow-ups on the agenda to create a suitable opportunity to conduct interviews. Another limitation is that the issue was considered sensitive for some people to participate in the interview, and in some cases, they did not participate in the interview. To mitigate this issue, the researcher assured the interviewees that their names would not be mentioned and that their information would remain completely confidential. The other study is that gray sources were not examined in this study.

### Acknowledgments

The authors would like to thank the Vice-Chancellor for Medical Affairs, Kerman University of Medical Sciences, and the colleagues of the Hospital Quality Improvement and Patient Safety Unit.

### Authors' Contribution

Conceptualization: Mahmood Nekoeimoghadam.
Data curation: Mohammadreza Tavakoli.
Formal analysis: Mohammadreza Tavakoli.
Funding acquisition: Reza Kazemi.
Investigation: Mohammadreza Amiresmaeili.
Methodology: Mohammadreza Amiresmaeili.
Project administration: Mahmood Nekoeimoghadam.
Resources: Mahmood Nekoeimoghadam.
Software: Reza Kazemi.
Supervision: Reza Kazemi.
Validation: Mohammadreza Tavakoli.
Visualization: Mohammadreza Tavakoli.
Writing–original draft: Mohammadreza Tavakoli.

### Competing Interests

The authors declare that there is no conflict of interest.

### Ethical Approval

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors. This study is a part of a doctoral thesis approved by Kerman University of Medical Sciences (Ethical Approval code: IR.KMU.REC.1400.330).

### Funding

This study was financially supported by Kerman University of Medical Sciences (Grant No. 99000862).

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