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Research Article

Effect of Feedback Provision on Improving Patient Safety Indices Based on Hospital Accreditation Model: A Study in Shahid Rahnemoon Hospital, Yazd

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Abstract

Background: Accreditation means systematic evaluation of health service centers with specific standards. One of the most important goals of the accreditation process is to improve patient safety. Patient safety visits are one of the most important standards for improving safety. One of the ways to increase the effectiveness of visits is holding feedback sessions.

Objectives: The present study was conducted with the aim of assessing the effect of feedback provision on improving patient safety indices based on the hospital accreditation model in Shahid Rahnemoon Hospital, Yazd.

Methods: The present study is a semi-experimental study with a before-and-after design that was conducted in Shahid Rahnemoon Hospital, Yazd, from September to December 2021 and January to August 2022. After each visit, formal feedback sessions were held with the attendance of patient safety team members and officials of the visited wards/units. Evaluation indicators included patient safety indicators in accreditation standards, such as error reporting, rate of unwanted events, and patient safety culture score. These were measured before and after feedback. The tools used were the patient safety standards evaluation checklist based on the accreditation model, the patient safety culture questionnaire, and other indicators extracted using documentation. The Patient Safety Culture Evaluation Questionnaire was completed by 360 nurses working in the hospital in the form of a census. Analysis was done using descriptive statistical tests and paired t-tests with STATA 14.2 software.

Results: Based on the results of the study, safety feedback was provided to increase patient safety indicators in different departments and units of hospitals [t = - 4.8652, w/df = 10, P = 0.0007, (P = 0.05)]. A significant difference was observed in the amount of error reporting (P = 0.031) and patient safety (P < 0.001) before and after the intervention. The degree of compliance with the dimensions of the patient safety culture had a statistically significant difference before and after the intervention (P < 0.001).

Conclusions: Providing a safety feedback program had a significant positive effect on the consumption and consequences of the patient's safety culture. Therefore, conducting regular safety visits and setting up a direct feedback program to each department/unit after the visit, and the follow-up of corrective measures, will lead to an increase in patient safety standards.

Keywords: Feedback; Patient Safety; Indices; Accreditation; Hospital

1. Background

Accreditation is defined as a process of systematic evaluation and determination of hospital credit by an independent professional organization using structural, process, and desired outcome standards. The hospital accreditation system ultimately leads to guaranteeing the quality, safety, effectiveness, and efficiency of hospital services (1, 2). Currently, the evaluation of treatment systems in Iran is carried out using the standards of the fifth round of national accreditation, with the highest score allocated to patient safety standards. Accreditation standards aim to create a culture of patient safety in healthcare facilities by establishing and predicting the required structures (2-4). Patient safety refers to the prevention of any injury and damage to the patient during health care provision (1, 5); it is considered a serious global challenge and a very important aspect of

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quality (2, 6). Unsafe health services in low- and middle-income countries annually lead to 134 million adverse events and about 2.6 million deaths. Evidence shows that in the Eastern Mediterranean region, up to 18% of hospital admissions are associated with adverse events, 80% of which are preventable (3, 7, 8). In addition to having unpleasant consequences for the patient and his family, unsafe services cause psychological pressure on health system employees and society members, and ultimately impose a huge economic burden on the health system and society. To prevent the damage caused by these errors and accidents, patient safety should be considered an organizational priority so that all the people in the organization realize its importance and internalize it, making patient safety a culture in the organization (9).

In many studies, the impact of accreditation on patient safety has been investigated as the most important consequence. In a systematic review by Hussein et al., 76 studies were explored with the aim of evaluating the impact of accreditation on patient safety, and a positive impact on other performance indices was observed (10). One of the most important ways to improve indicators and ensure effectiveness is to provide feedback on strengths and weaknesses (4). An effective feedback system is vital for any organization to keep up with changing needs over time and improve hospital quality and safety (5). Essentially, a good feedback system should be lively, dynamic, and interactive, connecting all stakeholders and engaging them in a sustainable loop of seamless information flow (6). Visits are one of the most important effective measures in improving patient safety standards and culture in hospitals. These visits include senior hospital managers visiting wards and units to observe performance and talk with employees during work with the aim of promoting a patient safety culture. One of the main advantages of these visits is the participation and team cooperation of managers and frontline staff to identify and remove obstacles to productivity and improve the quality of care and patient safety (11). This technique originally refers to the concept of "visit management" (12), which is known as "safety management visits" in hospitals (13). Safety management visits have been introduced as an effective instrument in promoting a safety culture. Among the goals of these visits are showing the commitment and responsibility of senior management to the safety of patients, personnel, and the community, increasing staff participation, creating a culture of free communication, identifying, appreciating, and sharing the best practices, and training employees in the field of patient safety concepts (13).

Patient safety management visits were first conducted in January 2001 at Boston Women's Hospital (BWH). The results of the pilot studies indicated that if the information obtained during the visits is properly analyzed, it can lead to positive safety modifications (14). One of the ways to increase the effectiveness of visits is to hold formal feedback meetings and provide feedback on its strengths and weaknesses to improve performance (15). The most important result of feedback is strengthening successful and correct learning, identifying errors, and correcting them (16). Providing feedback helps people contemplate the gap between actual and desired performance and identify ways to close the gap and improve it (15). Kraut et al. identified the normalization of feedback culture as a key component in creating a safe environment (17). Based on the review of the literature, in other studies, patient safety indices and the importance of safety visits have been investigated cross-sectionally.

2. Objectives

The present study was conducted with the aim of evaluating the role of patient safety visits followed by feedback sessions and their effect on improving patient safety indices in Shahid Rahnemoon Hospital in Yazd, central Iran.

3. Methods

This quasi-experimental study with a before-after design aimed at evaluating the improvement of patient safety standards based on the hospital accreditation model after providing feedback in Shahid Rahnemoon Hospital in Yazd. It was carried out from September to December 2021 and January to August 2022. Patient safety management visits to all departments and units of the hospital were carried out seasonally in the form of a predetermined program. The safety assessment team included the hospital director, management, patient safety officer, patient safety supervisor, and quality improvement unit officer. After the visits, which lasted for at least an hour and a half, the officials were informed and held according to the planning of the feedback meetings. The safety indicators in the study were monitored at the time of the visit and after the feedback.

The evaluated indices to assess the impact of patient safety feedback consisted of the measurement of patient safety standards in accreditation domains and patient safety indices, including error reporting rate, adverse event reporting rate, and patient safety culture score. The instrument used to examine the impact of patient safety feedback on its standards in the accreditation model was the patient safety standards evaluation checklist, which was developed and scored by the monitoring and accreditation center of the Ministry of Health, Treatment, and Medical Education in the form of the fifth-generation accreditation booklet (7). The textbook of accreditation standards entails three major domains: Leadership and management, care and treatment, and support for the service recipient. Evaluable axes in the field of care and treatment include nine axes as follows: General clinical care, acute and emergency care, surgical and anesthesia care, maternal and neonatal care, infection prevention and control, drug manage-

ment, imaging services, laboratory services, blood transfusion medicine, and ambulatory services (7). Eight axes were evaluated in the present study using the checklist. Maternal and neonatal care was excluded from the investigation due to the absence of this ward in the study hospital. Each parameter received between 0 - 2 points, and the mean score difference was compared before and after providing feedback.

To extract the patient safety indices (the rate of error reporting and the rate of reporting adverse events), the amount of reports registered by health care workers in the hospital's electronic systems (often the person who commits errors or adverse events) was also extracted. Medical error reporting categories are divided into care error, registration error, medication error, treatment error, laboratory error, diagnostic error, imaging error, patient misidentification, medical equipment error, and surgical error. The report of adverse events also includes 29 adverse life-threatening cases in the treatment of patients, including surgery on the wrong organ, surgery on the wrong patient, surgery with the wrong method, patient fall leading to death or complications leading to therapeutic intervention and prolongation of hospital stay, etc.

The standard questionnaire "Patient Safety Culture Survey," the HSOPSC hospital version, developed by the American Health Care Research and Quality Agency (2004), was used to evaluate the patient safety culture (18). This instrument has been used to evaluate patient safety culture in hospitals in different parts of the world. The validity and reliability of the instrument have been confirmed in the study by Mostafavi et al. (19). This questionnaire contains 42 items that measure 12 different dimensions of patient safety culture and includes the following: Openness of communication channels (3 items), feedback and communication about errors (3 items), frequency of reporting of adverse events (3 items), transfer of important patient information (4 items), management support for patient safety (3 items), non-punitive response to errors (3 items), organizational learning, continuous improvement (3 items), general perception of patient safety (4 items), work issues related to staff (4 items), manager/supervisor expectations and actions for patient safety (4 items), teamwork between hospital units (4 items), and teamwork within hospital units (4 items). A 5-point Likert Scale, ranging from highly disagree (1 point) to highly agree (5 points), was used in this questionnaire to obtain the opinions of the respondents (19). Safety was reported as 40 - 60 at the average level and 60 - 100 at the optimal level. The entry criteria for nurses to complete the patient safety culture questionnaire were at least 3 months of work experience in the departments, and the exit criteria were unwillingness to participate in the study.

The evaluation method was in line with the aim of the study as follows: Firstly, to monitor the initial status of the implementation of patient safety measures, a safety management visit was made to the wards, and the checklist of patient safety parameters was scored by the patient safety team. After scoring each parameter, immediate feedback was given to the relevant official at the same moment (the time of the visit). Besides, after each visit, formal feedback sessions were held with the attendance of patient safety team members and officials of the visited wards/units. After holding regular feedback meetings, in the first 6 months of 2021, the safety management visited the wards/units again, and the safety evaluation checklist was scored by the safety group. To measure the indices of reporting errors and adverse events, reports were received in the second 6 months of 2021 and the first 6 months of 2022 based on the output of the reporting systems. Corrective action in the field of the two mentioned indices by the safety team was as follows: After the medical error report was announced, it was analyzed by team members and shared with the health care providers in the form of a set of medical errors and scenarios (for the most important cases). Moreover, in case of adverse events, the relevant form was filled by the relevant person, and immediately after completing the form, an SMS was sent to the members of the safety team. After coordinating with the relevant ward, the root cause analysis (RCA) committee was held in the ward with the presence of the safety team and related members, and the root causes were investigated and finally sent to the vice-president of the university. Root cause analysis is the quality management process by which an organization searches for the root of a problem, issue, or incident after it occurs (8). The Patient Safety Culture Evaluation Questionnaire was also completed by 360 nurses working in the hospital in the form of a census. Data analysis was performed using STATA 14.2 with descriptive tests (mean) and paired t-tests.

4. Results

Based on the results of the study, providing safety feedback led to an increase in the average patient safety indices in different wards and units of the hospital. The results displayed in Table 1 suggest that a statistically significant difference was observed between the average safety of the patient before and after the intervention [t = - 4.8652, w/df = 10, P = 0.0007, (P = 0.05)]. The provision of safety feedback led to an increase in the average patient safety indices in different wards and units of the hospital, with the highest effectiveness observed among the inpatient wards, including the trauma wards of neurosurgery and the medical equipment unit and intensive care unit (ICU). However, the lowest effectiveness was calculated in the pharmaceutical care, blood bank, and infection control units, respectively. For the wards/units that had the least effectiveness, the initial evaluation score was at the optimal level.

Table 1. Comparison of Scores of Patient Safety Standards Before and After Providing Feedback

Wards/Units	Before	After	Mean Difference	P-Value
Inpatient wards				0.0007
Oral and maxillofacial ward	1.08	1.46	0.38	
Cardiovascular ward	1.08	1.37	0.29	
Internal medicine	1.08	1.40	0.32	
Orthopedics ward	1.08	1.47	0.39	
Neurosurgery ward 1	0.96	1.41	0.45	
Neurosurgery ward 2	1.04	1.45	0.41	
General surgery ward	1.05	1.38	0.33	
Urology ward 1	0.99	1.31	0.32	
Urology ward 2	1.17	1.45	0.28	
Total mean	1.06	1.41	0.35	
ICUs	1.24	1.64	0.40	
Emergency ward	1.86	2.25	0.39	
Ambulatory services	0.89	1.05	0.16	
Operating rooms	1.89	2.14	0.25	
Infection control	1.71	1.76	0.05	
Pharmaceutical care	2.11	2.12	0.01	
Imaging centers	0.55	0.94	0.39	
Laboratories	1.94	2.11	0.16	
Blood bank	2.21	2.25	0.04	
Medical equipment	1.23	1.70	0.47	

The results presented in Table 2 showed that the frequency of errors reported before and after the intervention had no statistically significant difference (P = 0.031). Based on extracting the frequency of reported errors before and after providing safety feedback, the difference in the frequency of reported errors after feedback (1267) increased by 490 reports compared to before (777) (61%). The highest frequency is related to care error (25.99%) and registration error (23.16%).

Table 2. Comparison of the Frequency of Errors Reported by Health Care Providers Before and After Providing Feedback

Index and Month	Frequency (2021)	Frequency (2022)	P-Value
Frequency of reported errors			0.031
March	18	60	
April	18	136	
May	18	140	
June	61	146	
July	88	73	
August	70	132	
September	49	102	
October	135	102	
November	80	108	
December	112	144	
January	92	82	
February	72	42	
Total	777	1267	
Mean	64.75	105.6	

The results given in Table 3 revealed that providing safety feedback led to a statistical increase in the frequency of adverse event reports in the hospital; yet, this increase was not statistically significant (P = 0.69). The frequency of immediate reports has increased by 71% in the compared time period. The most reported adverse events were related to patient falls. The statistical increase in the frequency of reports of side effects in the hospital shows the culture of safety and reduces the stress of nurses for reporting.

Table 3. Comparison of the Frequency of Adverse Event Reports by Health Care Providers Before and After Providing Feedback

Index	Frequency (2021)	Frequency (2022)	P-Value
Falling	4	12	0.69
Missing the patient for more than 4 hours	4	1	
The death or serious disability of the patient due to any error in the injection of the type of medicine, the dose of the medicine, the time of the injection of the medicine, etc.	1	0	
Surgery with wrong method	1	1	
Death or disability due to the use of infected equipment	1	1	
Total	11	15	

Based on the results displayed in Table 4 and the analysis of the results of the patient safety culture evaluation questionnaires from the nurses' point of view, the degree of compliance with the dimensions of the patient safety culture had a statistically significant difference before and after the intervention (P < 0.001), with the mean difference being 4 points after providing feedback compared to before feedback (59.4 - 63.4) and at the desired level. In terms of dimensions, the highest impact and mean difference (6 points) was in the dimension of general perception of patient safety, and the lowest impact and mean difference (0.3) pertained to workload issues and the number of staff.

Table 4. Comparison of Patient Safety Culture Scores Before and After Providing Feedback

Dimensions	Before	After	Mean Difference	P-Value
Frequency of error reporting	58.2	61.8	3.6	< 0.001
General perception of patient safety	60	66	6	
The supervisor's expectations and actions to improve patient safety	67	72.5	5.5	
Organizational learning	66.8	72	5.2	
Teamwork within organizational units	67.8	70.9	3.1	
Open communication channels and honesty in communication	60.25	61.5	1.25	
Communication and providing feedback regarding errors	54.6	63.5	8.9	
Non-punitive response when errors occur	50.57	53.7	2.9	
Issues related to workload and number of employees	51.8	52.1	0.3	
Hospital management support for safety	59.5	63	3.5	
Teamwork between hospital units	59	61.1	2.1	
Transferring the patient in the hospital and exchanging information about him/her between the units	58	62.1	4.1	
Total	59.4	63.4	4	

5. Discussion

The findings of this study provided invaluable information about how providing safety feedback can improve patient safety culture. Based on the results, feedback provision enhances compliance with safety standards in healthcare and improves its indices in different wards and units of the hospital. Gandhi et al. pointed out the importance of follow-up and feedback after patient safety programs in hospitals, rendering the hospital management team's role important in promoting patient safety culture (20). If organizations want to learn from failures in providing care, effective feedback from incident reporting systems in healthcare is essential (21). In this study, feedback was used to increase awareness of medical errors, improve the quality of healthcare, and ensure a culture of safety.

Based on the results, the highest effectiveness of the intervention of providing patient safety feedback was observed in ICUs and medical equipment units. Aghaei Telikani et al. positively assessed the impact of

accreditation interventions on patient safety parameters in the operating rooms of a Tehran hospital, showing that the patient safety index increased after the first visits (22). Another review study suggested that teamwork and communication training interventions improve the safety culture in emergency wards and can have a positive effect on patient recovery (23). Consistent with these results, the patient safety score improved in the emergency ward with the intervention of providing feedback in this study. Since the results of some studies indicate that critical units such as intensive care units have a high impact on patient safety culture (24), it is natural that safety culture interventions exert the greatest effect on these wards. It is advisable to consider safety culture promotion programs specifically in ICUs to diminish the incidence of medical errors. This result was similar to the findings of studies by Al-Surimi et al. (25) and Evans et al. in Australia (26). This may be because providing safety feedback and open communication are part of quality improvement processes and encourage employees to report more errors. Benn et al., in their study in London, emphasized the importance of completing the safety feedback cycle, including reporting, analysis, feedback, and conducting corrective measures to reduce the vulnerabilities of healthcare systems and patients (27). In another study, Louise Dowell highlighted the role of forming patient safety teams to reduce accidents and serious errors by investigating weekly hospital incidents and reporting feedback to ward nurses (28).

In this study, the effect of the intervention (providing feedback) on the outcomes of the safety culture, including the frequency of error reports, adverse event reports, and general perception of patient safety, was evaluated positively. These results demonstrated that the intervention (providing feedback) can ultimately lead to better results for patient recovery because the reporting of errors and adverse events increased after providing feedback, which increases the health care provider's experience and educates others.

In the study by Molai et al., managerial and motivational factors significantly promoted the reporting of medical errors and side effects. Therefore, the management and safety team should remove these obstacles by expanding the culture of encouraging reporting in the organization (9). Reporting of errors in the studied hospitals was not favorable, and improving the safety culture in hospitals is a fundamental measure (10). Conversely, based on the research by Al-Surimi et al. (25) in Saudi Arabia and Lam et al. (24) in the United States, the intervention (accreditation) had no significant effect on the frequency of reported events. These findings are inconsistent with the present results, possibly due to differences in the type of intervention applied and the cultural disparity of the countries.

The results showed that as a result of the intervention, the overall score of patient safety culture increased from 59.4% to 63.4%. The findings of Zwijnenberg et al. also indicated the positive effect of providing patient safety feedback on improving patient safety culture in Dutch hospitals (29). Furthermore, studies by Khaksar et al. (30), Tahan et al. (31), and Phaqihzadeh et al. (32) related to the effect of the intervention (training of patient safety culture and accreditation) on promoting safety culture in Iranian hospitals obtained similar results to this study. A review study showed that interventions and strategies to improve safety culture could improve doctors' and employees' perceptions of safety culture (33). The study by Gharaee et al. suggested that the mean score of patient safety culture had a significant relationship with the occurrence of adverse incidents (34). Monitoring systems for compliance with patient safety culture principles and providing feedback in healthcare organizations improve safety. However, a systematic review (2023) showed that the overall scores of patient safety culture are low and moderate in most hospitals in Iran (35). These findings indicate the weakness of patient safety culture in Iranian hospitals, demanding more attention due to its importance and impact on improving hospital performance.

5.1. Limitations of the Study

The study sample only included the employees of one hospital, which limits the generalizability of results to other hospitals in Iran. Future research on a larger scale is recommended.

5.2. Conclusions

The safety feedback program had a significant positive impact on patient safety culture dimensions and outcomes. Therefore, managers must widely promote the culture of patient safety in healthcare organizations by applying interventions and improvement strategies. Some aspects of the safety culture, which suffer from poor compliance and insignificant improvement due to the intervention in this study, need special attention. Specifically, the staff dimension in Iran needs to be promoted with the proper management of human resources, such as the appropriate redistribution of existing forces and the hiring of specialized personnel. Additionally, the culture of scolding for errors must be replaced by a "just culture" approach to strengthen professional and institutional responsibility, identify systemic failures as a priority, and reduce errors. Empirical evidence demonstrated the usefulness of providing patient safety feedback to healthcare providers.

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Authors' Contribution:

A.RE and NB had the original idea for this work;

N.B, A.RE and A.E designed the study; N. BA, A.RE and MH.D performed analysis; and N.B and A.RE wrote the manuscript. All authors critically revised the draft of the manuscript and approve its final version.

Conflict of Interests:

There is no completing interest to declare.

Data Reproducibility:

https://filetransfer.io/data-package/qv3QVWYD#link

Ethics Approval:

This study was conducted following approval from the Clinical Research Development Center of Shahid Dr. Rahnemoon Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, under the ethics code IR.SSU.SRH.REC.1401.017. All collected data were used solely for research purposes, and confidentiality was maintained throughout all stages of the study. To protect participants' privacy, the data were reported without names or personal identifiers. In addition, participation in the study was voluntary and informed.

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