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Review Article

An Inquiry Into the Patient Safety Management Patterns: A Review Study

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Abstract

Background and aims: Patient safety, as one of the main components of the health care quality, implies avoiding any injury and damage to the patient when providing health care services. In other words, patient safety means his or her safety against any adverse and harmful event when receiving health care services. Based on the above-mention explanations, the present study was conducted to determine the patterns of patient safety management.

Methods: A systematic review method was used to meet the objectives of the study. In order to access the scientific documentation and evidence related to the subject published during 1998-2018, English keywords including "Patient Safety Model", "Patient Safety", and "Patient Safety of Management" were searched in Medine, PubMed, and Google Scholar databases and Persian versions of these keywords were also looked for in Jihad-e Daneshgahi's Scientific Information Database (SID) and Iranian Journals database (Magiran).

Results: The findings of this study suggested that most of the studies on designing a model for patient safety highlighted important dimensions including guidance and leadership, communication, organizing, information management, control and monitoring, participation and decision-making, as well as planning and coordination.

Conclusion: In general, using patterns and frameworks designed for patient safety improves patient safety against uncertain incidents since the human and financial consequences of such incidents impose overwhelming sufferings on patients.

Keywords: Inquiry, Pattern, Patient Safety

Introduction

Patient safety is considered as one of the main components of health care quality and refers to the issue of avoiding any injury and damage to the patient when providing health care services.[1] In fact, patient safety means his or her safety against any adverse and harmful event while receiving health care services. No harm principle in the Hippocratic Letter also confirms the fact that the provision of safe and high-quality health care services has been in the hotspot of global attention.[2] Hence, more than 140 years ago, Florence Nightingale declared that "do no harm" is the most basic and essential requirement for health and medical care when providing health care. Thus, the World Health Organization introduces patient safety as an endemic concern.[3,4] The first goal of a health care institution is *"do no harm"* the patient and avoid endangering his/her safety as a result of health care provision.[5] Although the past decades have witnessed many advancements in the field of patient safety, the patients still suffer from many injuries due to medical errors because the health sector is categorized among the most high-risk sectors compared to other sectors and industries.[6] It is important to note that safety is a general and global value and all cultures must do their best to maintain and implement it since the existence philosophy of all health care systems is to provide and promote the community health and achieving this goal is only possible by providing desirable and required health care services.[7] Patient safety can be traced back to a report by the American Health Quality Association affiliated with the American Institute of Medicine entitled "Human beings are fallible: Create order, safer health". Following this report, many other reports were released to put the unsafety of the health care system in the spotlight.[8] With the publication of the report, more attention was paid to the issue of the patient's safety and the patient's health became a major

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concern in the health system.[9] In health care systems, errors are an important issue for practitioners, managers, health care policymakers, as well as the general public and patients. Therefore, identifying and minimizing professional errors are considered as the main priorities for health care providers. In this regard, special attention is paid to patient safety models.[10] Some of eminent characteristics of the patient's safety culture include disclosing the errors, training employees regarding patient safety, having an error reporting system, applying reporting systems to improve the procedures, stopping blaming those perpetuating mistakes, having teamwork, establishing clear communication between the departments and their collaboration with each other towards the benefits of the patients, and focusing on the issue of safety by top leaders.[11,12] Therefore, patient safety may be compromised by the lack of communication between the health care providers, which is affected by some human factors such as interpersonal relationships. In addition, preventable medical errors occur due to the lack of proper communication, along with the lack of coherence and coordination.[13] Previous research shows that only 26% of the adverse events, errors, and factors related to the performance of care providers such as the lack of skills and adequate knowledge and technical errors threat patients' safety. However, the major systemic errors threatening the patients' safety (74%) are related to other factors like the lack of policy and program implementation, inadequate supervision, delays in the provision of care, faulty equipment, as well as the lack of staff and unavailability of equipment. Based on the results of another study, many other factors such as system communications and the type of management and resources can influence patient safety as well.[14] Accordingly, recognizing patient safety patterns can play an important role in institutionalizing patient safety management. Therefore, the current study aimed to determine the patterns of patient safety management.

Methods

A systematic review method was used based on study purposes. In order to access the scientific documentation and subject-related evidence published from 1998 to 2018, English keywords such as "Patient Safety Model", "Patient Safety", "Patient Safety of Management" were searched in several databased including Medline, PubMed, and Google Scholar. Further, the Persian version of the above-mentioned keywords was also searched in Jihad-e Daneshgahi's Scientific Information Database (SID) and Iranian Journals database (Magiran). The inclusion criteria were all quantitative and qualitative articles published in Persian and English that were related to the subject and the exclusion criteria included those articles that had an overlap with the other articles or the articles that their full texts were not available. Two independent researchers (i.e., a PhD student in Medical Education and PhD in Health Education) checked the articles and a total of 102 articles were examined in the initial search. In order to assess the quality of the obtained studies, their titles and abstracts were examined carefully. At this stage, 45 articles were omitted due to their overlapping with other articles and the lack of access to their full texts. Finally, 57 papers were selected in the first stage and the patient safety priorities were examined. Then, 23 articles introducing a model for patient safety were included based on the aim of the study (Figure 1). Next, a data extraction form, designed based on the purpose of the research, was used to extract data. Eventually, the obtained results from reviewing the articles were analyzed, summarized, and reported after completing this form.

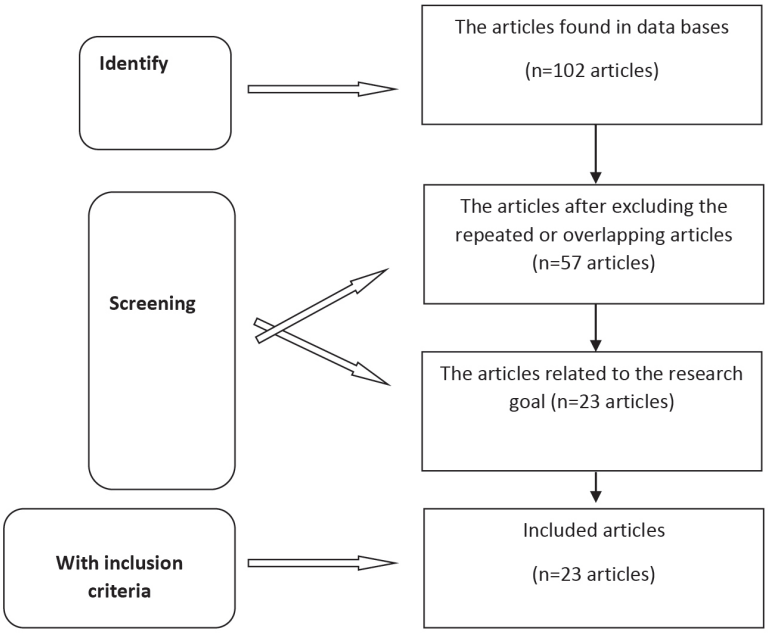

Figure 1. Method of the Included Articles.

Results

Fifty-seven out of 102 examined papers were found to address various aspects of patient safety. Of these 102 papers, 28 and 29 ones were domestic and foreign papers, respectively. In addition, 42, 13, and 2 papers were quantitative, qualitative, and review papers, respectively. The most important discussed topics in these articles belonged to governance and leadership, communication, organizing, information management, control and monitoring, participation and decision-making, planning, coordination and teamwork, organizational learning and continuous improvement, patient safety training, the role of individual factors, reporting, job satisfaction, safe environment, safe clinical services, non-punitive responses in the case of error, professional ethics, medication management, infection reduction, safety culture, and effective clinical system, respectively (Table 1).

In the second step, 23 articles, each representing a patient's safety model and its related dimensions, were extracted and examined based on the aim of the study. Fourteen articles highlighted the dimensions of management and leadership in introducing their pattern and, in this respect, addressed various issues such as developing a patient care plan, providing an opportunity for discussion, ensuring the availability of resources, focusing on proper behavior, ensuring the presence of the qualified staff, highlighting succession planning, creating structural solidarity, discussing the commitment of hospital senior management to patient safety, presenting policies and clinical guidelines, providing support services, disseminating quality management culture, focusing on human resource empowerment, following up patient safety plans, supporting the training process, creating effective and positive communication between management and staff, removing the constraints, auditing support and prioritizing it by senior hospital management, releasing organizational goals and responsibility, respectively.[11,13-23] Eleven articles referred to planning in introducing their pattern and in this area, highlighted planning for manpower, equipment, and health care providers, planning for joint work, having a patient safety program, developing a patient safety culture, implementing Innovations in the Patient Safety Program, planning for patient orientation realization, establishing Health Justice Program and Patient Safety Improvement Program in each risk, planning for practice and documentation, having strategic and operational planning for patient safety, planning for using the results of monitoring and evaluation, as well as developing the quality assurance strategy and the content of the work and technology.[11,13-15,17,21-26] Similarly, 7 articles, in introducing their pattern, delved into decision making, especially developing thinking skills for patient safety, evidence-based decision-making, theory and practice correlation, and decision making, providing the possibility for patient involvement in safety process and decision-making for treatment, promoting innovation and creativity in decision-making, making decisions for the proper implementation of procedures, making decisions based on predetermined priorities, and focusing on solving the problem.[4,14,15,24,27-29] Further, 10 articles, in introducing their pattern, addressed organizing dimension, particularly issues such as acting toward achieving the goals, participating in teamwork, sharing information for direct care of the patient, perceiving the role and responsibilities, using the resources optimally, providing high productivity, hiring skilled staff, organizing knowledge- and standard-based care, developing professional skills, organizing pharmaceutical and blood transfusion systems, focusing on organizational learning and teamwork among organizational departments, identifying the defects in organizational factors and equipment, organizing the involvement of all staff in patient safety program, organizing human resources, providing equipment and facilities, investing in human resources, and improving the structures.[4,11,15-17,23,25,29,30] Likewise, 15 articles referred to communications in their introduction of the pattern, and in this area, the most important items were communicating with patients accurately and allocating enough time to them, having verbal, as well as visual and auditory communication, obtaining patients history, reporting to

Table 1. The Most Important Subjects Addressed in the Examined Articles

Item	Subject of the Paper	No.
1	Governance and leadership	30 papers
2	Communication	18 papers
3	Organizing	18 papers
4	Information management	17 papers
5	Control and monitoring	15 papers
6	Cooperation and decision making	15 papers
7	Planning	10 papers
8	Coordination and teamwork	9 papers
9	Organizational learning and continuous improvement	8 papers
10	Patient safety training	7 papers
11	The role of individual factors	4 papers
12	Reporting, job satisfaction, safe environment, safe clinical services, and non-punitive responses in the case of error	2 papers
13	Professional ethics, medication management, infection reduction, safety culture, and effective clinical system, respectively	1 paper

health care providers, encouraging patients to criticize and express their views, creating a friendly environment for patient safety in the hospital, identifying the patient's proper identity, sharing patient-related practices, establishing personal and professional communication, as well as leaders and staff communication, having effective communication at patient handover, establishing communication before and after safety incidents, encouraging the desire to help the leader, focusing on the manager's communication with the patient, the physician's communication with the nurse, and the coordination and communication between team members.[4,11-13,16,18,20,23-25,27-31] Coordination dimension was highlighted in nine articles including topics such as positive and constructive interaction, mutual support, coordination and cooperation among health care providers at high levels of workload, coordination in critical situations, patient transfer and dispatch, and ensuring the accuracy of medication, inter-department coordination and implementation of patient safety priorities, sharing experiences, coordination in continuity of care, coordination and preparation, coordination in providing clinical services to patients, and finally, interpersonal coordination and collaboration.[13,14,19,21,23,27,28,30] Eventually, 11 articles highlighted the control dimension when introducing their pattern and in this area, controlling safety condition of the patient, evaluating and measuring the results, assessing the quality of health services continuously, controlling functions and processes, controlling the equipment and ensuring its faultlessness, controlling treatment protocols, following up corrective actions, showing agreement with corrective actions by senior hospital management, providing real-time supervision, ensuring the non-occurrence of the errors, safe systems, the manner of evaluating and disseminating the evaluation results, providing governance management and supervision, and monitoring the beds.[11,15,19,22,23,26,29,30]

Discussion

The evaluation of the published articles suggests that leadership plays a key role in patient safety in all medical centers and hospital departments. Providing appropriate opportunities to discuss the performance and ensuring access to qualified human resources and equipment is one of the main responsibilities of the senior management of the hospital regarding providing patient safety.[30] Hence, developing patient safety capabilities and predicting substitute forces and attracting their participation in parallel with creating structural solidarity in patient safety management is very important.[24] On the other hand, patient safety managers should be well-versed in leadership skills, have general insights about patient safety, and support patient safety plans.[11] Furthermore, they are committed, having a flexible morality, to put empowering employees and maintain patients' dignity on their agenda [15]. It is also critical to follow the implementation of the patient safety plan and establish effective communication with the staff and patients, along with applying the standards and policies of patient safety management.[16,17] Planning is considered another effective element in managing patient safety. Patient safety managers help to develop the safety and innovation and creativity culture in patient safety plans through planning for human resources, finance, equipment, and teamwork.[4,24] Realizing patient orientation in the health system and planning based on the weight of the patient's safety hazards, along with determining how to improve the safety in each hazard, is one of the priorities of patient safety management,[14,15] which is achievable through formulating strategies and policies and taking advantage of practical and applied patterns.[17] The patterns prepare the ground for decision-making and stimulate patient safety manager to think out scientific decisions in order to solve patient safety problems using evidence, as well as employees, patients, and society views.[4,24] This partnership clarifies patient safety priorities and decision-making based on them and thus promotes productivity and the optimal use of the resources.[14,27] Of course, this requires organizing the performance in line with the goals, applying the skilled staff, organizing a knowledge- and standard-based care, and continuously developing professional abilities.[24,30] Part of these abilities includes organizational learning and teamwork and participation in brainstorming for decision making.[11,15] In addition, organizing leads to increased productivity and controls the organizational and individual factors which cause errors.[17,31] Organizing resources provides a framework for improving patient safety and leads to method and activity improvement.[19] In other words, improving the structures can improve health care processes and outcomes.[23] Nevertheless, organizing the resources for achieving patient safety management requires related information and technology. Training the members of the treatment team and information flow through collecting information, examining information, and using the data based on scientific research are among the items that are employed to improve the patient's safety process.[4,24,30] Conversely, insufficient knowledge and training regarding patient safety and inadequate information regarding the application of techniques can endanger the patient's safety.[16] Hence, techniques related to identifying safety priorities, reporting critical situations, using patient handover methods, clarifying the problems based on the data, and taking advantage of the feedback and inconsistent audits can be useful in this respect.[26,29] However, this information alone does not suffice, rather sharing it through interpersonal and organizational communication can double the value of the information. Moreover, communicating with patients, using a common language, holding verbal and auditory communication with them and encouraging them to express their views and opinions, and sharing safety incidents with patients are other factors that complement this approach.[4,24,30] On the other hand, professional leadership communication with employees leads to improvements in performance and recommendations provided to the patients,[11,12] because poor communication

leads to committing error regarding the patient.[16] Therefore, communication forms in light of coordination. Positive and constructive cooperation and collaboration among the staff in the case of high volume of work, the prediction of needs, and the evaluation of the employee's performance regarding patient safety such as coordination in proper patient handover and dispatch and proper medication consumption are some of the most important issues.[28,30] In parallel, paying attention to the implementation of patient safety priorities in each department, which results from sharing the experiences, is a matter of importance as well.[14] Additionally, the structure and content of each internal audit are due to the coordination and concentration of the Patient Safety Audit Board on health care policies.[21] Such policies facilitate the control of patient safety management, evaluate the results, and ensure the quality of health care services.[15,30] The treatment protocol is another tool that can be used to monitor patient safety management. Such protocol can be utilized to identify corrective actions and the measures related to them and thus follow up them through control measures.[28,29] In addition, controlling the functions and processes and using real-time monitoring techniques are also highly important.[26] Table 2 represents an overview of the approaches adopted by the examined patterns.

Conclusion

Promoting patient safety, as a challenge for health systems in all countries around the world, is one of the most important factors for improving the quality of health care services. Obviously, unsafe care is a constant feature of health care services, and treatment and its successful consequences for each patient, along with professional competence of each and every health service provider also depend on a range of other factors. Health care leaders worldwide struggled to make measurable progress in patient safety steps taken to develop conceptual frameworks for patient safety research, 6 to reduce preventable harm, 7 to engage physicians in quality and safety at academic medical centers. Lao Tzu observed

Table 2. A Summary of the Findings of the Reviewed Patterns

Item	Paper Title (Pattern)	Authors	Approach Overview
1	Evaluation of PMCH Model Adoption on Teamwork and Impact on Patient Access and Safety	Khanna et al	Recommends a workgroup formed based on education and cooperation; Presents an integrated framework to provide patient-centered health services.
2	The COPA Model: A Comprehensive Framework Designed to Promote Quality Care and Competence for Patient Safety	Lenburg et al	Recommends planning for human resources and equipment, developing professional capabilities for patient safety, nominating substitutes, and organizing knowledge- and standard-based care and professional communication.
3	WHO Patient safety friendly hospitals	Ravaqi et al	Notes the commitment of the senior management of the hospital to the patient's safety plan and the availability of qualified staff, clinical policies and guidelines, and standardized methods and support services; The possibility of patients' involvement and the power to adopt right decisions about how to treat and participate in the patient's safety activities.
4	Investigating the status of patient safety culture from nurses' point of view in selected educational hospitals affiliated to Shahid Beheshti University of Medical Sciences	Shamsuddini Lori et al	Suggests staff training regarding patient safety, the presence of a reporting system for different kinds of error, taking advantage of a reporting system to improve processes, avoid blaming individuals, teamwork, transparent communication between units and departments, and their collaboration in order to benefit the patient and top leaders' attention to safety.
5	Investigating the managers point of view on the Observance of Comprehensive Quality Management Components in Tehran University of Medical Sciences Hospitals	Rabieian et al	It highlights planning for the realization of a patient-centered health care system, planning for justice, flexibility, and staff empowerment, maintains patient dignity, senior managers' commitment to patient safety, and the dissemination of quality management culture, decision-making for members' involvement, adopting decisions to promote innovation and creativity, and continuous evaluation of the quality of health care services.
6	EU Validation of a Minimal Information Model for Patient Safety Incident Reporting and Learning Systems	World Health Organization (WHO)	The minimum information pattern for patient safety, as a joint commitment of the countries, begins with reporting and learning and with the support of the World Health Organization. The primary goal of patient safety is to emphasize the reports of the organization to learn from experiences and the reporting system should be such that its response is useful, visible, and justifying.
7	Ddonabedian's Lasting Framework for Healthcare Quality	John Z. Ayanian and Howard Markel	Its approach to the quality and patient safety was in the field of technical management, diagnosis, prevention, enhancement, coordination, the continuity of care, physician and patient communication, economic efficiency, and social values. Further, it focuses on values and pays attention to the results of the principle of patient-centered care was Ddonabedian conceptual framework.
8	Examining the success rate of clinical governance in Tehran hospitals	Mosaddeq Rad et al	It is a system for ensuring the quality of health care services and is responsible for and makes health care organizations responsible in relation to the provided services. Clinical governance components include management and leadership, staff training, clinical audit, clinical efficacy, risk management, information management and employee, and community involvement in providing health services.

Table 2. Continued

Item	Paper Title (Pattern)	Authors	Approach Overview
9	Prioritizing the risk of patient-related hazards in health care units with a hierarchical analysis model, a case study of a teaching-therapeutic hospital	Zarezadeh et al	Hierarchical analysis model is one of the most commonly used methods for decision making, which is used to prioritize the factors affecting the services provided, including quality and clinical errors. The hierarchy analysis process is one of the most comprehensive systems designed for decision making with multiple criteria.
10	Understanding and managing patient safety risks	Zarei et al	The Swiss cheese model in analyzing medical errors emphasizes focusing on their "root causes" and believes that pseudo-errors should not be merely highlighted, rather all contextual conditions making the occurrence of an error possible should be taken into consideration as well.
11	Investigating the Errors of Operative Room Processes in the Namazi Hospital Using Failure Mode and Effect Analysis (FMEA)	Kavousi et al	It is a powerful and useful tool for evaluating potential errors and preventing them from happening. In addition, it is an important technique for identifying and eliminating potential or well-known errors, which is considered to increase the reliability and safety of complex systems and to provide information and decision making on risk management.
12	Improving the Patient Satisfaction Index in Health Care Center Using Six Sigma Approach	Mostadam et al	Six Sigma uses a standardized step-by-step process with specific tools for directing projects called DMAIC, which stands for Define, Measure, Analysis, Improve, and Control. DMAIC is a systematic approach used to reduce variability and achieve improvement in six sigma.
13	Evaluating the Effectiveness of HSE Education Based on the EFQM Excellence Model	Ramezani et al	Organizational Excellence Model consists of nine items in two capabilities and outcomes categories. Performance indicators include leadership, policy and strategy, human resources (staffing), partnerships, resources and processes, and the results indicators encompass customer outcomes, HR outcomes, community outcomes, and key performance outcomes. In this model, 50% of the scores (500 points) is attributed to the capabilities section and 50% (500 points) to the results section with a total score of 1000.
14	.H-R Model: Basic Framework of Sciences and Technologies in Patient Safety, International Association of Risk Management in Medicine	Sakai	This pattern is concentrated in the field of guidance and leadership with a clinical risk management approach before the incident and crisis management after the incident, in the field of information, with the approach to assessing the clinical risk before the accident, and identifying the crisis after the incident and in the field of communication with the communication approach before the incident and communication after the crisis.
15	Understanding and managing patient safety risks	Zarei et al	This pattern is defined to provide patient safety by for classifying the root causes of errors in the organizational framework, organizing and management, work environment, team, staff, duty, and patient.
16	Evaluation of Nurses' Viewpoints regarding the Relationship Between the Components of the Work System of the Nursing Personnel and the Safety of Patients Admitted to the Hospitals of Zanjan, Using the SEIPS Model	Doroodi et al	According to SEIPS Model, the set of factors consisting of the employees' system of work in the field of health includes the components related to technology and medical equipment, physical environment conditions, personnel tasks, and the characteristics of employees and organizations.
17	"Going solid": A model of system dynamics and consequences for patient safety	Cook and Rasmussen	A descriptive model that describes the coordination and management of health services in order to maintain patient safety and considers decision-making realm necessary for bed management.
18	Development of Nurses' Pharmaceutical Errors Model	Zaqari Tafreshi et al	The conditions causing the error are expressed as individual and organizational factors. The complexity of care, team factors, communication, work experience, and work dynamics are some of these factors.
19	A Model of Safety Performance in Perioperative Registered Nurses	Nuntawinit et al	Safety culture, management values, communication, education, and safe systems and environment are some of the elements which create patient safety.
20	Optimal governance of patient safety: A qualitative study on barriers to and facilitators for effective internal audit	van Gelderen et al	It addresses factors affecting internal audit and enumerates the position of the audit committee, audit structure and content, the composition of the audit committee, and the cultural factors as the requirements of an effective audit.
21	The Effect of Using the SBAR Model in Nurses' Shift handover on communication dimension of Nursing Care Quality from Patients' point of view	Baqaei et al	This pattern includes the current and past status of the patient (information), along with examinations and advice (communication) and codifies the standardized method of patient handover.
22	An Organizational Learning Framework for Patient Safety	Edwards	It draws a framework for patient safety. In this framework, improving work processes, learning, organizational culture, and employees' knowledge and skills play an important role.
23	The Role of Interpersonal Relations in Healthcare Team Communication and Patient Safety: A Proposed Model of Interpersonal Process in Teamwork,	Lee and Doran,	It establishes the framework of interpersonal communication and performance in caring teams based on perception, assessment, feedback, and performance, and explains the processes, communication structure, coordination, and the performance of the health care team.

that "the journey of a thousand miles begins with a single step." Once the goal is set, the challenge is to take that first step. This organizational learning framework for patient safety uses the current language of management and provides a structure for identifying the most promising leverage points for improvement.[32] The findings of the study suggested that the most important factors, among others, were guidance and leadership, communication, organizing, information management, control and monitoring, participation and decision making, and planning and coordination. Therefore, taking advantage of the patterns and frameworks designed for patient safety helps to increase patient safety against uncertain incidents. The human and financial consequences of different types of incidents may impose overwhelming suffering on human beings. For example, the SBAR (Situation-Background- Assessment- Recommendation) technique provides a framework for communication between the members of the health care team about a patient's condition. SBAR is an easy-to-remember, concrete mechanism which is useful for framing any conversation, especially the critical ones and requires a clinician's immediate attention and action. In addition, it allows for an easy and focused way to set expectations for what will be communicated and how it is communicated between the members of the team, which is essential for developing teamwork and fostering the culture of patient safety.[33]

Ethical Approval

Not applicable.

Conflict of Interest Disclosures

None.

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