DISASTER AND EMERGENCY

MEDICINE JOURNAL

The effect of executive managers' walk round on patient safety culture in emergency nurses

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ORIGINAL ARTICLE

THE EFFECT OF EXECUTIVE MANAGERS' WALK ROUND ON PATIENT SAFETY CULTURE IN EMERGENCY NURSES

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ABSTRACT

INTRODUCTION: Effective teamwork is vital in providing safe and effective patient care, especially in a high-risk setting such as the emergency ward. The culture of patient safety has a direct impact on the way work is performed and, consequently, on the safety of patients. One of the ways to promote the patient safety culture is to support the hospital's management team and improve the teamwork climate. This study was conducted to investigate the effect of executive managers' walk-round on patient safety culture in emergency ward nurses.

MATERIAL AND METHODS: This quasi-experimental study was carried out in four emergency wards (two wards for the experimental group and two wards for the control group) in Darab Hospital. From each group, 32 nurses were selected by stratified random sampling method and participated in the study. For the experimental group, executive managers' walk rounds were conducted for five months. The safety culture questionnaire was completed before and after the intervention in both groups. Data were analysed with SPSS22.

RESULTS: The average scores of the patient safety culture of the two experimental and control groups were not statistically different before the intervention. Overall, the total score of the intervention group was 130.44 ± 7.80 and that of the control group was 124.19 ± 8.76 after the intervention, which showed a statistically significant difference ($p \leq 0.001$). More specifically, in the intervention group, the scores of "teamwork within hospital units" ($p = 0.015$), "overall perceptions of safety" ($p = 0.042$), "communication openness" ($p = 0.020$), "non-punitive response to the error" ($p = 0.001$), "feedback and communication about errors" ($p = 0.021$) were higher compared to the control group.

CONCLUSIONS: This study provided further insight into the importance of hospital management's support in improving patient safety culture. Executive managers' walk-rounds increased the culture of patient safety perceptions of emergency ward nurses; thus, it is suggested to regularly conduct executive managers' walk-rounds to improve the level of patient safety and increase the quality of service to patients.

Keywords: patient safety; executive managers' walk-round; patient safety culture; nurse; emergency ward

INTRODUCTION

Safety culture forms the cornerstones of excellent care delivery that should be considered in all patient care programs [1]. Patient safety is defined as "the act of avoiding, preventing, or ameliorating adverse outcomes or harms resulting from the hospital care process" [2]. The infrastructure of healthcare is based on the culture of patient safety [1, 2] *i.e.*, the foundation and organization of the healthcare system are built around prioritizing and maintaining patient safety. This implies that all healthcare practices, policies, and systems are designed with the primary goal of ensuring that patients are protected from harm and receive safe, high-quality care. Organizational culture encompasses the shared values, beliefs, and norms that influence behaviour within an organization, and in healthcare, it is crucial for fostering a patient safety

culture. This means that patient safety is deeply embedded in every aspect of the organization, starting with leadership commitment to safety, which is reflected in policies, actions, and resource allocation [3]. It permeates through open communication, where staff at all levels are encouraged to report safety concerns without fear of retribution. Continuous learning and teamwork are emphasized, ensuring that safety practices are consistently applied and improved upon. By integrating patient safety into the core of organizational culture, healthcare providers create an environment where safety is a fundamental and intrinsic value, leading to better patient outcomes and a more resilient healthcare system [4, 5]. Positive attitudes towards safety reduce unsafe behaviours among healthcare professionals [6]. Vikan's study showed that enhancing patient safety culture decreases adverse events (AEs) [7]. Unsafe services harm patients and families, add psychological stress to healthcare staff, and lead to accidents due to the influence of culture on behaviour. Healthcare-related AEs are the third leading cause of mortality in the United States [6]. Moreover, studies have shown that on average, in approximately 10% of all hospitalized cases, patients sustain harm to various degrees, while it is estimated that up to 75% of these errors can be prevented [8]. It is estimated that between 5% and 10% of health-related costs are caused by unsafe clinical services that lead to harm to patients [9].

Untoward medical accidents which can be defined as adverse events or incidents that occur during medical care, are also very common in Iran. In a study conducted in Jahorm in Fars province, it was revealed that 91% of patients had an untoward accident [10]. Nursing errors, as a part of these accidents, can occur at any point in nursing activities and procedures, and the consequences may be weak or severe [11]. Nursing is a stressful task and a stressful profession with a high workload, long working hours, emotional strain, exposure to violence and abuse, and risk of occupational hazards, with a high rate of occupational accidents and diseases [12]. The emergency ward significantly impacts other hospital wards [13], in which urgent services are provided to patients at all hours around the clock, showing the importance of optimal performance and effective communication between nurses as well as communication with other healthcare professionals of nurses to maintain the safety of patients and the quality of patient care [14].

In 2020, World Health Organization (WHO) also emphasized the need to link patient safety and professional work settings and introduced the campaign "Safe Health Workers, Safe Patients" on Global Patient Safety Day. In 2022, Kizir et al. [15] concluded that safe nursing environments positively affect patient safety attitudes. Emergency nurses face health

and safety risks that impact their well-being and patient care quality. Unsafe conditions harm patient safety, while organizational culture and safety perceptions influence performance and outcomes [16]. Clarifying staff values and beliefs about safety is key to reducing accidents and improving performance [17]. Lee et al. [2] emphasized that hospital management and supervisors play a crucial role in motivating nurses to adopt patient safety behaviours, ensuring psychological safety for staff.

Effective safety culture management is essential for organizational safety improvements [18]. Managers' walk-rounds provide a structured approach for hospital managers to discuss safety with frontline staff, enhancing patient safety culture [19, 20]. These walk-rounds enable nursing leaders to engage directly with healthcare staff, demonstrating a commitment to improving patient care quality [21]. Executive managers' walk-rounds promote a safety culture and improve patient safety and care quality [22]. To review the organizational strategy to achieve the goals aligned with the study, including increasing patient safety and improving patient care, as well as increasing the resources involved in this progress, including improving the treatment staff, managers' walk-round holds a predictable meeting for discussion between managers and front-line personnel by identifying opportunities to improve care processes that lead to better patient safety outcomes [21]. Healthcare and safety managers can reinforce and cultivate a strong belief in the importance of safety and a positive safety culture among all service providers. By doing so, they play an effective role in improving their work environment and ensuring patient safety [23]. US studies found that management rounds improved safety, care quality, and safety awareness in paediatric emergency and pharmacy wards [24, 25]. Given the important role of executive managers in ensuring patient safety, the authors developed and studied the effects of the innovative executive walk-round program on patient safety culture, which is explained below.

Hospital intervention program and study purpose

The designed program is unique in that it included different categories of nurses, such as ward nurses, ward supervisors in shifts, head nurses, clinical and educational supervisors, and hospital matrons. Additionally, the senior managers of the hospital, including the internal manager of the hospital, the person in charge of quality and safety improvement, and the hospital dean, were also directly involved in the implementation of the walk-round. Furthermore, at the end of the walk-round of senior managers, micro-teaching, defined as the short learning sessions usually lasting between 5 to 20 minutes followed by feedback and

discussion to improve specific teaching strategies and techniques, with patient safety content was presented to nurses. Considering the high prevalence of untoward errors and the low safety of patients due to the high rate of medical errors, as well as the importance of increasing patient safety culture on reducing unwanted errors, the present study was conducted to explore the impact of executive managers' walk rounds on emergency ward nurses' perceptions of patient safety culture.

MATERIAL AND METHODS

Design

This quasi-experimental study was conducted in a large general hospital affiliated with Shiraz University of Medical Sciences. The hospital included a triage ward and two lines, each with two emergency wards. One line, comprising two wards, was designated as the intervention site (experimental group), while the other line, also with two wards, served as the control group. All emergency wards were selected randomly and followed similar patient safety policies and approximately the same number of nurses for each ward. The number of referral patients was about 4646 ± 54 and inpatients were about 797 ± 37 for each month in each group. The workload was different for doctors and nurses, however, this study focused on nurses and the workload for each nurse for each month was 422 patients in each group.

Setting and sample

Based on Pakzad et al.'s [26] study, the sample volume was estimated to be 29 people, taking into account the two-way confidence interval of 5%, and test power of 80%. Considering a 10% subject attrition rate, 32 nurses were considered as the research sample. Stratified random sampling was used for subject selection; the number of selected nurses from each ward was proportional to the total number of nurses so that 32 nurses in the experimental group and 32 nurses in the control group entered the study.

$$n = \frac{(Z_{\frac{\alpha}{2}} + Z_{\beta})^2 2s^2}{(\bar{x}_1 - \bar{x}_2)^2}$$

The inclusion criteria were willingness to participate in the study and having at least one year of clinical work experience in the emergency ward of the hospital.

Variables and measurements

The primary variable was the impact of the executive walk-round program on patient safety culture. This was measured using the Hospital Survey on Patient Safety Culture (HSOPSC), completed by all participating nurses.

Interventions in the emergency ward

Weekly information posters related to safety tips were installed in the emergency ward. For the experimental group, safety protocols were sent through the channel in the social messenger, including reports on the occurrence of medication errors and other errors, safety tips, and how to interact with colleagues from other treatment groups (laboratory, pharmacy, radiology, *etc.*) Moreover, periodically, safety-related messages were placed in the form of pamphlets, posters, or stands in the wards. Safety manuals were also provided to nurses. These items were prepared based on Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS). In addition to the mentioned issues, notebooks were placed to record suggestions related to improving safety in emergency wards. Besides, nurses could send their opinions, criticisms and suggestions to the hospital matron through WhatsApp social network. This program was accessible from inside and outside the hospital and anonymity/nonanonymity was optional. Another online program (hospital's electronic incident reporting system) was also available for people to report errors anonymously which is utilized to report, track, and analyse patient safety incidents. This system allows healthcare staff to promptly document safety issues or adverse events, thereby facilitating timely interventions and promoting continuous improvement in patient care. In both cases, after registering the events, the nurses received a tracking code through which they could track the cases.

Executive managers' walk-round

Walk-rounds were conducted by senior managers (hospital manager, matron, educational and clinical supervisors and infection control, quality and safety improvement officer and hospital dean) during the first, third and fifth week on Saturday. The walk-rounds of medial managers (clinical supervisors, educational supervisors and emergency ward staff) were conducted on Monday mornings and evenings during the first to fourth weeks. The approximate duration of each walk round varied between 30 and 45 minutes. Nurses who failed to participate in the managers' walk-round (due to busy shifts or no shift on the days when the walk-round was conducted) were asked to participate in one of these repeated walk-rounds. By the way, overtime hours were considered by the hospital manager for the nurses who participated in the meetings outside the shift. The sessions were held in such a way that about 30 to 45 min of the first walk-round of executive managers was held for the experimental group and

immediately about 20 min of micro-teaching class was held for both experiment and control groups (Tab. 1). The protocol for the "Executive managers' walk rounds" uses a structured method to engage participating nurses. Executive managers generally start the conversation with guiding questions about safety issues. These questions aim to foster open dialogue and identify any concerns or suggestions nurses may have about patient safety and overall care quality.

At the beginning of each management round, pre-reported suggestions and criticisms of nurses were read, and the managers expressed the actions taken to implement the suggestions in the following meetings. Additionally, the nurses also verbally announced their suggestions to the executive managers and received feedback in the walk-round meeting of managers. After the weekly walk-round finished, the walk-round was done by the senior managers in the first week of every month. The medial managers' walk-round was done in the second and fourth week of every month, and this program was carried out for three more months. Subsequently, demographic and patient safety culture questionnaires were completed again by the nurses of both experimental and control groups. After completing the questionnaires, to comply with the ethical issues, the round with the senior and medial managers continued for another two months and all the nurses who worked the shift could participate in the rounds.

Hospital survey on patient safety culture

This questionnaire includes 42 items that measure 12 different dimensions of patient safety culture. These dimensions include frequency of event reporting, overall perception of safety, supervisor/manager expectations and actions promoting safety, organizational learning-continuous improvement, teamwork within hospital units, communication openness, feedback and communication about error, non-punitive response about errors, staffing, management support for patient safety, teamwork across hospital units, and handoffs and transitions. This questionnaire was developed by the Agency for Healthcare Research and Quality (AHRQ) in 2004 [27] and has been used many times to evaluate the opinions of hospital staff about patient safety culture in different parts of the world [28–31]. The validity and reliability of this questionnaire were confirmed in the study by Chen et al. in 2010 [32]. The psychometric evaluation of this questionnaire was done in Iran by Lazemi et al. [33] and it has been used in various studies. In the study by Kakemam et al. [34], the reliability of this questionnaire was reported between 0.69 and 0.90 through the calculation of Cronbach's α. The intervention facilitated an improved reporting of potential errors by providing structured protocols and

training sessions aimed at enhancing error recognition and reporting among the staff. This approach led to observed improvements in the accuracy and frequency of error reporting within the study period.

Data collection

Nurses meeting the inclusion criteria were invited via phone calls to participate in the study. The orientation session was meticulously organized to ensure participants were well-informed about the study and adequately prepared for their involvement. During the session, the study's purpose was thoroughly explained through a detailed presentation, highlighting the goals, objectives, and significance of the research. Written informed consent was then obtained, with facilitators distributing consent forms, explaining the consent process, and addressing any questions participants had to ensure they fully understood their rights. Participants were also asked to complete the HSOPSC during the session, with clear instructions provided and time allocated for its completion. Additionally, separate WhatsApp channels were created for the control and experimental groups to facilitate communication, disseminating important information such as dates for the managers' walk-rounds and other announcements. This comprehensive orientation session ensured that all participants were properly briefed, consented, and equipped with the necessary information to participate in the study. Separate WhatsApp channels were created for the control and experimental groups to disseminate information, including dates for the managers' walk-rounds and other announcements.

A preliminary workshop was scheduled for both groups to cover topics such as patient safety culture, safety-threatening situations, and TeamSTEPPS, developed by the AHRQ [35]. This included communication skills, mutual support, leadership, and situation monitoring. Each skill was first presented as a lecture. Then, clinical cases were presented and discussed.

Data analysis

IBM SPSS22 was used for data analysis. The Kolmogorov–Smirnov case was used to check the normal distribution of data. Frequency and percentage as well as mean and standard deviation were used to report descriptive statistics. A paired t-test was used to determine the difference in nurses' safety culture before and after the managers' walk-round in each group. To compare the safety culture of nurses in two groups, an independent t-test was used. Figure 1 provides a comprehensive summary of the entire research methodology process.

Ethical considerations

The present study was conducted in accordance with the principles of the Revised Declaration of Helsinki, Statement of Ethical Principles Regarding Physicians and Other Participants in Medical Research Involving Human Subjects. After obtaining the code of ethics in the research with code of ethics No.: IR.SSU.REC.1400.174, the researchers presented to the hospital officials and explained the objectives of the study to them.

All participants including senior and medial managers of the hospital signed a written informed consent to participate in the study. All participants were assured all personal information would remain confidential and that they could withdraw from the study at any stage. Moreover; the research ethics committees of Shahid Sadoughi University of Medical Sciences, Yazd, Iran approved the study (Ethical code: IR.SSU.REC.1400.174).

RESULTS

In total, 64 nurses participated in this study, 32 in the intervention, and 32 in the control group. Besides, 23 nurses (71.9%) in the experimental group and 20 nurses (62.5%) in the control group were female. Also, 30 nurses (93.75%) in the experimental group and 29 nurses (90.63%) in the control group hold a bachelor's degree, and the rest hold a master's degree, respectively. Besides, 22 nurses (68.87%) in the experimental group and 22 nurses (68.87%) in the control group had a rotating shift, and the rest had a fixed morning shift. In terms of qualitative and occupational demographic variables such as gender, education, and work shift, there was no statistically significant difference between the two study groups (Tab. 2).

There was no difference between the experimental and control groups in the mean scores of different dimensions of patient safety culture before the intervention. According to the results of the independent t-test, it was found that there was a difference between the two study groups after the test in the dimensions of overall perceptions of safety ($p = 0.042$), teamwork within hospital units ($p = 0.015$), communication openness ($p = 0.020$), non-punitive response to the error ($p = 0.001$), and feedback and communication about errors ($p = 0.021$). In other words, the intervention significantly enhanced these dimensions in the experimental group compared to the control group, while no significant differences were found between the groups in other dimensions (Tab. 3).

The mean overall score of patient safety culture in the experimental group increased significantly from 123.89 ± 13.60 before the intervention to 130.44 ± 7.80 after the intervention ($p = 0.001$). whereas no statistical difference was observed in the control group

(p = 0.503). The mean overall score of the patient safety culture of the experimental and control groups before intervention did not show any statistically significant difference (p = 0.503); yet, after intervention, the mean overall score of the patient safety culture in the experimental group was higher than that of the control group, which was statistically significant (p = 0.001) (Tab. 4).

DISCUSSION

This study was carried out to investigate the effect of executive managers' walk-round on patient safety culture in emergency nurses. Based on the findings of patient safety, the overall score of patient safety culture after the intervention was significantly higher in the intervention group compared to the control group, which was statistically significant. The results of this study demonstrated that there was a significant difference between the two experimental and control groups after intervention in the dimensions of the overall perception of safety, teamwork within hospital units, communication openness, non-punitive response to the error, and feedback and communication about errors in the experimental and control groups, but there was no statistically significant difference in other dimensions. Faridi et al. [36] found that electronic training improved the safety culture in nurses, consistent with the present results. Najafi Ghezeljeh et al. [37] concluded that e-learning increased nurses' knowledge, skills, attitudes, and competence towards patient safety culture. The results of the systematic review conducted by Alsabri et al. [38] revealed that teamwork and educational interventions based on personnel communication promote safety culture in emergency wards and the implementation of safety culture programs may be considered to reduce the incidence of medical errors and complications. Sadrollahi et al. [39] found that eight 6–8-hour workshop-style training courses on caregiving ethics effectively promoted patient safety culture among clinical nursing managers. Agbar et al. [40] conducted a systematic review and meta-different levels of analysis to examine empirical evidence on the impact of implementing patient safety education programs on patient safety culture and concluded that patient safety education can promote patient safety culture in healthcare professionals. In explaining the findings of the present study, it can be said that the walk rounds support the hospitals' senior and medial managers of the organization, and the point that one of the topics related to safety was discussed every week in the meetings held, showed the importance of the program, and the repetition of this program in consecutive weeks led to its effect on the nurses' perception of patient safety culture. On the other hand, nurses could freely convey

their opinions and suggestions to the senior and junior management, and later, seeing the possible changes made and applying the suggestions, they became more encouraged. During the sessions, it was tried to discuss disagreements between employees as well as those between employees and managers with intra-group discussions, and clarifications were made on the discussed issues regarding safety. Some of the structural problems were related to the existence of disagreements or the lack of a safety protocol implementation manual. During these meetings were identified controversial bottlenecks and specified implementation methods. The discussion sessions helped to improve cooperation and interactions among the personnel. Lee believes that the support of hospital management and supervisors motivates nurses to develop patient safety behaviours. Of course, these supports should be accompanied by an increase in mental safety for nursing staff which affects patient safety through some behaviours in nursing staff including error reporting and transparency, engagement and performance, team collaboration, stress reduction, and innovation and improvement [2]. In the present study, managers repeatedly emphasized the importance of patient safety during walk-rounds and micro-teaching; they mentioned that "patient safety is one of the hospital's priorities" and the presence of managers alongside the staff and repetition of the walk-round probably might have improved the attitude of nurses toward patient safety. The presence of managers and the discussion of safety-related problems may have strengthened the relationship between managers and nurses. In addition, solving the challenges between the emergency ward and other wards, it was tried to help improve the communication between the emergency ward and other wards, which may have helped to improve the nurses' safety attitude. Moreover, managers' involvement also provided an opportunity for staff to participate in patient safety initiatives. Promoting a supportive and non-punitive work environment has probably encouraged personnel to provide services in accordance with safety standards, which is considered important for both patients and health service providers in ensuring patient safety and service effectiveness. Mostafaei et al. [41] stated that hospital managers should consider improving patient safety as the main priority and personnel should be encouraged to report errors without fear of punishment and blame. During the walk rounds, one of the key focus areas was implementing interventions aimed at explaining the types of errors and increasing awareness of safety issues. These interventions were presented by managers and supervisors to ensure staff understood the nature of errors and the importance of reporting them. On the other hand, error reporting boxes were placed in different places in the emergency ward to report possible errors. These notebooks were anonymous, and the identities of the people were kept secret. Also, the personnel could register errors through a

software program with anonymous access that was on the computers in the ward. In this case, a tracking code was given to the individual, who could track the actions taken by entering the tracking code. During the walk rounds, the authors tried to establish a friendly atmosphere between the managers and nurses of the emergency ward, *etc.*, so that later, the concerns related to the punitive response to the error report were resolved and the paths of error reporting were paved.

Limitations of the study

This study was conducted in the emergency wards of one hospital and the results were specific to the research community; thus the generalization of findings to other settings should be done with caution. The results indicated the positive effect of managers' walk-round on some dimensions of patient safety culture in nurses. Hence, it is essential to promote safety culture among nurses by first conducting a thorough needs assessment to identify the specific dimensions of safety culture that are underdeveloped. Based on this assessment, targeted strategies should be implemented to address these areas. This might include focused training programs, improved communication protocols, enhanced reporting systems, and leadership support initiatives to ensure a comprehensive and effective approach to fostering a strong safety culture.

In considering the limitations of this study, it is essential to reflect on the potential applicability of the findings to other organizations. While conducted in a specific environment, the study suggests the potential transferability of results to similar settings. However, variations in organizational culture, resources, and operational contexts across institutions may influence the generalizability of these findings. Therefore, caution is advised when extrapolating these results beyond the study setting. Further research in diverse organizational contexts is recommended to validate the broader applicability of these findings.

CONCLUSIONS

In conclusion, the study highlights the significant positive impact of executive managers' walk-rounds on patient safety culture among emergency nurses. The intervention group showed substantial improvements in various dimensions of safety culture compared to the control group, reflecting enhanced perceptions of safety, teamwork, communication openness, and responses to errors. These findings underscore the importance of managerial engagement and structured discussions in fostering a supportive environment where nurses

feel empowered to contribute to safety initiatives and report errors without fear of reprisal. Continued emphasis on these strategies can further enhance patient safety outcomes and promote a culture of continuous improvement in healthcare settings.

Article information and declarations

Data availability statement

The dataset of this study can be provided if needed.

Ethics statement

The medical ethics committee of Shahid Sadoughi University of Medical Sciences approved this study (Ethical code: IR.SSU.REC.1400.174). Informed written consent was obtained from all nurses and managers, and confidentiality of information was assured. All study questionnaires were collected anonymously.

Author contributions

All authors contributed to the design and conduct of the study. Designed the study and wrote the manuscript — BA; involved in the interpretation of the data, and the coordinator researcher — MJ. PN and NS collected the data and conducted the intervention — PN and NS. All authors revised the manuscript critically and final approval of the manuscript.

Funding

Acknowledgments

Conflict of interest

The authors declared no conflicts of interest with respect to authorship and publication of this article.

Supplementary material

None.

REFERENCES

1. Amaral C, Sequeira C, Albacar-Riobóo N, et al. Patient safety training programs for health care professionals: a scoping review. J Patient Saf. 2023; 19(1): 48–58, doi: 10.1097/PTS.0000000000001067, indexed in Pubmed: 35948319.

2. Lee SE, Dahinten VS, Lee JH. Testing the association between the enabling and enacting factors of patient safety culture and patient safety: structural equation modelling. BMC Nurs. 2023; 22(1): 32, doi: 10.1186/s12912-023-01196-x, indexed in Pubmed: 36747192.

3. Henderson A, Cooke M, Creedy DK, et al. Nursing students' perceptions of learning in practice environments: a review. Nurse Educ Today. 2012; 32(3): 299–302, doi: 10.1016/j.nedt.2011.03.010, indexed in Pubmed: 21514982.

4. Pronovost P, Sexton B. Assessing safety culture: guidelines and recommendations. Qual Saf Health Care. 2005; 14(4): 231–233, doi: 10.1136/qshc.2005.015180, indexed in Pubmed: 16076784.

5. Bisbey TM, Kilcullen MP, Thomas EJ, et al. Safety culture: an integration of existing models and a framework for understanding its development. Hum Factors. 2021; 63(1): 88–110, doi: 10.1177/0018720819868878, indexed in Pubmed: 31424954.

6. Sarsangi V, Khalevandi AA, Zarei E, et al. Attitude of the nurses of Kashan Educational Hospitals toward Workplace Safety Climate in 2014. Community Health J. 2017; 8(1): 18–27.

7. Vikan M, Haugen AS, Bjørnnes AK, et al. The association between patient safety culture and adverse events — a scoping review. BMC Health Serv Res. 2023; 23(1): 300, doi: 10.1186/s12913-023-09332-8, indexed in Pubmed: 36991426.

8. Shreve J, Van Den Bos J, Gray T, et al. The Economic Measurement of Medical Errors., in The Society of Actuaries 2020, Agency for Healthcare Research and Quality.

9. Da Silva M, Flood CM, Goldenberg A, et al. Regulating the safety of health-related artificial intelligence. Healthc Policy. 2022; 17(4): 63–77, doi: 10.12927/hcpol.2022.26824, indexed in Pubmed: 35686827.

10. Asadiyan M, Heidari MR, Dolatkhah HR. Incidence of ar and related risk factors in the transfer of patients from intensive care units. Pars J Med Sci . 2022; 18(3), doi: 10.52547/jmj.18.3.1.

11. Ramadhan K, Nurfatimah , Hafid F. Perception of health teams on the implementation of strategies to decrease nursing errors and enhance patient safety [Letter]. J Multidiscip Healthc. 2023; 16: 863–864, doi: 10.2147/JMDH.S414395, indexed in Pubmed: 37035257.

12. Stacciarini JMR, Tróccoli BT. Occupational stress and constructive thinking: health and job satisfaction. J Adv Nurs. 2004; 46(5): 480–487, doi: 10.1111/j.1365-2648.2004.03022.x, indexed in Pubmed: 15139936.

13. Ahmadi O, Talkhoncheh MG, Naieni AP, et al. Quality of nursing care and documentation with overcrowding in emergency department. Iranian J Emerg Med. 2016; 3(2): 57–53, doi: 10.22037/ijem.v3i2.9975.

14. Ghezeljeh TN, Jaefari S, Haghani SH, et al. Communication and self-efficacy competency of nurses in emergency departments: a multicenter study. Iran J Nurs. 2021; 34(129): 82–95, doi: 10.52547/ijn.34.129.82.

15. Kizir N, Ozsaker E. The effect of the emergency service work environment on the patient safety attitudes of nurses. J Patient Safe Risk Manag. 2022; 28(3): 126–132, doi: 10.1177/25160435221138667.

16. Shirali G, Afravi M, Nezamodini ZS. Comparison between safety attitudes of CCU nurses in the educational and non-educational hospitals of Ahvaz. Iran Occup Health J. 2016; 12(6): 89–97.

17. Relihan E, Glynn S, Daly D, et al. Measuring and benchmarking safety culture: application of the safety attitudes questionnaire to an acute medical admissions unit. Ir J Med Sci. 2009; 178(4): 433–439, doi: 10.1007/s11845-009-0352-2, indexed in Pubmed: 19437091.

18. Bates DW, Singh H. Two decades since to err is human: an assessment of progress and emerging priorities in patient safety. Health Aff (Millwood). 2018; 37(11): 1736–1743, doi: 10.1377/hlthaff.2018.0738, indexed in Pubmed: 30395508.

19. Sexton JB, Adair KC, Leonard MW, et al. Providing feedback following Leadership WalkRounds is associated with better patient safety culture, higher employee engagement and lower burnout. BMJ Qual Saf. 2018; 27(4): 261–270, doi: 10.1136/bmjqs-2016-006399, indexed in Pubmed: 28993441.

20. Sølvtofte AS, Larsen P, Laustsen S. Effectiveness of patient safety leadership walkrounds™ on patient safety culture: a systematic review protocol. JBI Database System Rev Implement Rep. 2017; 15(5): 1306–1315, doi: 10.11124/JBISRIR-2016-003004, indexed in Pubmed: 28498172.

21. Klimmeck S, Sexton JB, Schwendimann R. Changes in safety and teamwork climate after adding structured observations to patient safety walkrounds. Jt Comm J Qual Patient Saf. 2021; 47(12): 783–792, doi: 10.1016/j.jcjq.2021.09.001, indexed in Pubmed: 34654669.

22. Alsowaida YS, Kovacevic MP, Belisle C, et al. Implementation of pharmacy executive quality and safety walkrounds at a tertiary academic medical center. Hosp Pharm. 2022; 57(2): 211–216, doi: 10.1177/00185787211010155, indexed in Pubmed: 35601721.

23. Maeda Y, Asada Y, Suzuki Y, et al. Safety walk-round education to develop risk prediction skills of novice health professional students. The Asia Pacific Scholar. 2021; 6(2): 78–87, doi: 10.29060/taps.2021-6-2/oa2406.

24. Shaw K, Lavelle J, Crescenzo K, et al. Creating unit-based patient safety walk-rounds in a pediatric emergency department. Clinical Ped Emerg Med. 2006; 7(4): 231–237, doi: 10.1016/j.cpem.2006.08.012.

25. Alsowaida YS, Kovacevic MP, Belisle C, et al. Implementation of pharmacy executive quality and safety walkrounds at a tertiary academic medical center. Hosp Pharm. 2022; 57(2): 211–216, doi: 10.1177/00185787211010155, indexed in Pubmed: 35601721.

26. Pakzad N, Norouzi K, Khoshknab MF, et al. A comparison of the effect of virtual and lecture-based patient safety education on patient safety culture among nurses. Qom Univ Med Sci J. 2016; 10(9): 27–34.

27. Pourshareiati F, Amrollahi M. Patient safety culture from rahnemon hospital nurses' perspective. Occup Hygin Health Promo J. 2017; 1(1): 52–61.

28. Mardon RE, Khanna K, Sorra J, et al. Exploring relationships between hospital patient safety culture and adverse events. J Patient Saf. 2010; 6(4): 226–232, doi: 10.1097/PTS.0b013e3181fd1a00, indexed in Pubmed: 21099551.

29. Singer S, Lin S, Falwell A, et al. Relationship of safety climate and safety performance in hospitals. Health Serv Res. 2009; 44(2 Pt 1): 399–421, doi: 10.1111/j.1475-6773.2008.00918.x, indexed in Pubmed: 19178583.

30. Huang DT, Clermont G, Sexton JB, et al. Perceptions of safety culture vary across the intensive care units of a single institution. Crit Care Med. 2007; 35(1): 165–176, doi: 10.1097/01.CCM.0000251505.76026.CF, indexed in Pubmed: 17110876.

31. Pettker CM, Thung SF, Raab CA, et al. A comprehensive obstetrics patient safety program improves safety climate and culture. Am J Obstet Gynecol. 2011; 204(3): 216.e1–216.e6, doi: 10.1016/j.ajog.2010.11.004, indexed in Pubmed: 21376160.

32. Chen IC, Li HH. Measuring patient safety culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC). BMC Health Serv Res. 2010; 10: 152, doi: 10.1186/1472-6963-10-152, indexed in Pubmed: 20529246.

33. Lazemi Z, Barkhordari-Sharifabad M. Translation and psychometric evaluation of the persian version of the "Nursing Profession Self-Efficacy Scale". BMC Nurs. 2023; 22(1): 24, doi: 10.1186/s12912-023-01182-3, indexed in Pubmed: 36698171.

34. Kakemam E, Albelbeisi AH, Davoodabadi S, et al. Patient safety culture in Iranian teaching hospitals: baseline assessment, opportunities for improvement and benchmarking. BMC Health Serv Res. 2022; 22(1): 403, doi: 10.1186/s12913-022-07774-0, indexed in Pubmed: 35346174.

35. Kakemam E, Rouzbahani M, Rajabi MR, et al. Psychometric testing of the Iranian version of the TeamSTEPPS teamwork perception questionnaire: a cross-cultural validation study. BMC Health Serv Res. 2021; 21(1): 705, doi: 10.1186/s12913-021-06739-z, indexed in Pubmed: 34271935.

36. Faridi S, Farsi Z, Rajaei N. The effect of electronic training of patient safety principles on the level of patient safety culture in nurses working in a selected military hospital in tehran. Military Caring Sci. 2022; 9(4): 369–382.

37. Najafi Ghezeljeh T, Farahani MA, Ladani FK. Iranian nurses' perception of factors contributing to medical errors in intensive care unit: a qualitative study. Acta Med Iran. 2022; 60(3), doi: 10.18502/acta.v60i3.9005.

38. Alsabri M, Boudi Z, Lauque D, et al. Impact of teamwork and communication training interventions on safety culture and patient safety in emergency departments: a systematic review. J Patient Saf. 2022; 18(1): e351–e361, doi: 10.1097/PTS.0000000000000782, indexed in Pubmed: 33890752.

39. Sadrollahi A, Bagherpur M, Daiizadeh H, et al. Survey of effectiveness, professional ethics training in the attitude of clinical management nurses to the patient safety culture. Edu Ethics Nursing. 2020; 9(3–4): 26–37, doi: 10.52547/ethicnurs.9.3.4.26.

40. Agbar F, Zhang S, Wu Y, et al. Effect of patient safety education interventions on patient safety culture of health care professionals: systematic review and meta-analysis. Nurse Educ Pract. 2023; 67: 103565, doi: 10.1016/j.nepr.2023.103565, indexed in Pubmed: 36731258.

41. Mostafaei D, Aryankhesal A, Dastoorpour M. Patient safety culture assessment of clinical and paraclinical staff perspective in selected university of medical sciences hospitals in Tehran. Iran J Health Edu Health Promo. 2018; 6(3): 293–301.
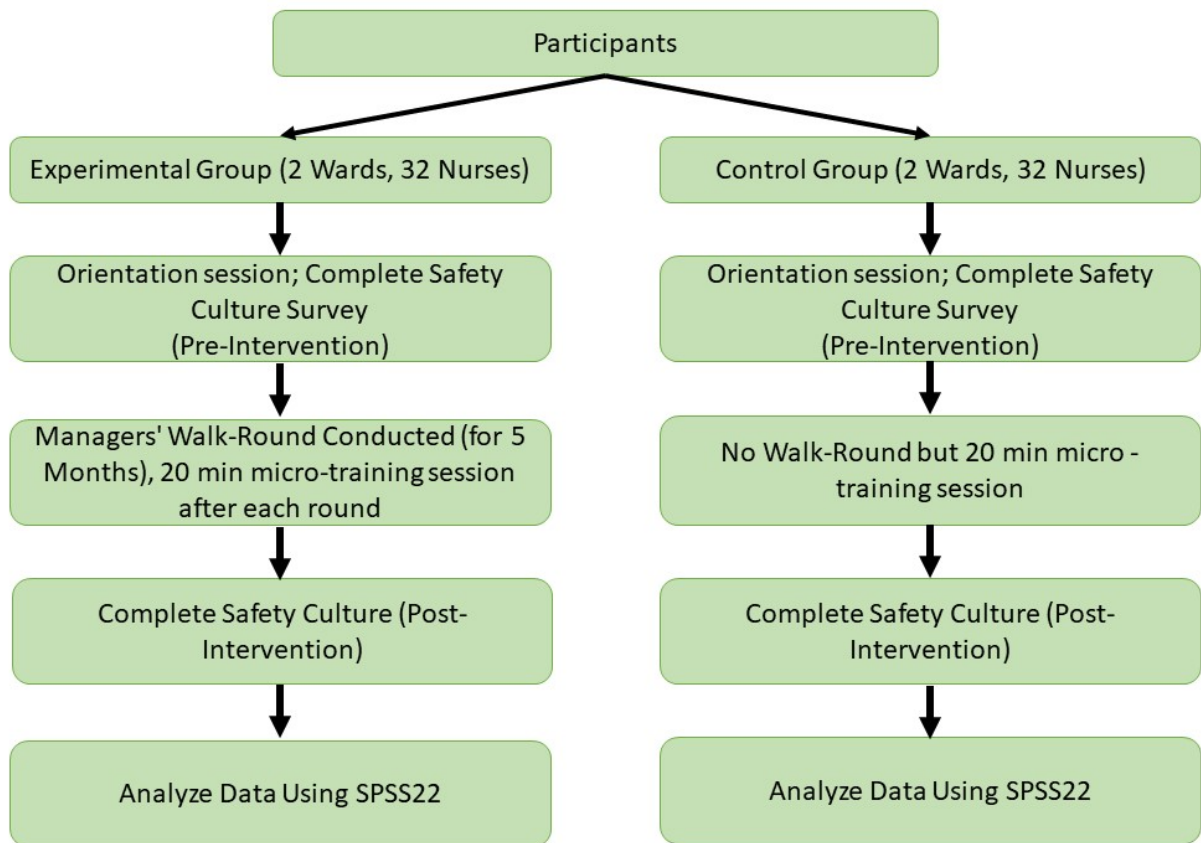
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                          ┌─────────────────────────────┐
                          │        Participants         │
                          └─────────────────────────────┘
                    ┌──────────────────┴──────────────────┐
                    ▼                                      ▼
      ┌─────────────────────────────┐      ┌─────────────────────────────┐
      │ Experimental Group (2 Wards, │      │  Control Group (2 Wards, 32  │
      │         32 Nurses)          │      │           Nurses)           │
      └─────────────────────────────┘      └─────────────────────────────┘
                    │                                      │
                    ▼                                      ▼
      ┌─────────────────────────────┐      ┌─────────────────────────────┐
      │ Orientation session; Complete│      │ Orientation session; Complete│
      │     Safety Culture Survey    │      │     Safety Culture Survey    │
      │      (Pre-Intervention)      │      │      (Pre-Intervention)      │
      └─────────────────────────────┘      └─────────────────────────────┘
                    │                                      │
                    ▼                                      ▼
      ┌─────────────────────────────┐      ┌─────────────────────────────┐
      │ Managers' Walk-Round Conducted│     │  No Walk-Round but 20 min    │
      │ (for 5 Months), 20 min micro-│      │    micro - training session  │
      │ training session after each  │      │                              │
      │            round            │      │                              │
      └─────────────────────────────┘      └─────────────────────────────┘
                    │                                      │
                    ▼                                      ▼
      ┌─────────────────────────────┐      ┌─────────────────────────────┐
      │  Complete Safety Culture     │      │  Complete Safety Culture     │
      │      (Post-Intervention)     │      │      (Post-Intervention)     │
      └─────────────────────────────┘      └─────────────────────────────┘
                    │                                      │
                    ▼                                      ▼
      ┌─────────────────────────────┐      ┌─────────────────────────────┐
      │  Analyze Data Using SPSS22   │      │  Analyze Data Using SPSS22   │
      └─────────────────────────────┘      └─────────────────────────────┘
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Figure 1. Overview of research methodology: evaluating the impact of hospital managerial walk rounds on patient safety

Table 1. Overview of walk-round topics, time and type of executive managers

Walk round topic	Time	Executive managers
Emergency department safety, patient safety	Week 1, morning	Senior managers
Emergency department safety	Week 1, morning	Medial managers 1
Emergency department safety	Week 1, evening	Medial managers 2
High-risk drugs, documentation	Week 2, morning	Medial managers 1
High-risk drugs, documentation	Week 2, evening	Medial managers 2
Risk of falling, high-risk patients	Week 3, morning	Senior managers
High-risk patients: unconscious, elderly and infants	Week 3, morning	Medial managers 1
High-risk patients: unconscious, elderly and infants	Week 3, evening	Medial managers 2
Personal protection	Week 4, morning	Medial managers 1
Personal protection	Week 4, evening	Medial managers 2
Leadership, and supervision	Week 5, morning	Senior managers
Improvement of methods	Week 5, morning	Medial managers 1
Improvement of methods	Week 5, evening	Medial managers 2
Communication skills, mutual support	Week 6, morning	Medial managers 1
Communication skills, mutual support	Week 6, evening	Medial managers 2
Review of suggestions and reported errors, an overview of department safety, patient safety, mutual support	The morning of the first week of the month up to three months	Senior managers
Review of suggestions and reported errors, an overview of department safety, patient safety, mutual support	The morning of the second and fourth week of the month up to three months	Medial managers 1, 2

Table 2. Demographic characteristics of the participating nurses

p value	Experimental	Control	Group	
	Mean (± SD)	Mean (cSD)	Demographic characteristics	
0.226	34.85 (± 5.46)	33.11 (± 4.96)	Age	
0.145	9.22 (± 4.41)	7.67 (± 3.21)	Experience working in the emergency	
0.116	11.58 (± 5.59)	9.59 (± 4.76)	Total Experience working	
	Frequency [%]			
0.471	23 (71.88)	20 (62.5)	Female	Gender
	9 (28.12)	12 (37.5)	Male	
0.902	30 (93.75)	29 (90.63)	Bachelor's degree	Education
	2 (6.25)	3 (9.37)	Master's degree	
0.84	10 (31.25)	12 (68.75)	Only morning	Working shift
	22 (68.75)	20 (31.25)	Rotational	

cSD — common standard deviation; SD — standard deviation

Table 3. Comparison of patient safety culture before and after the intervention within and between groups

Dimensions	Group	Pre-test; mean (± SD)	Post-test; mean (± SD)	p value (within group)
Frequency of events reported	Experimental	10.93 ± 1.82	11.37 ± 1.18	0.282
	Control	10.63 ± 2.11	11.04 ± 1.68	0.194
	p value	0.583	0.402	
The overall perception of patient safety	Experimental	8.15 ± 1.69	9.39 ± 1.74	0.001
	Control	8.30 ± 1.46	8.59 ± 1.63	0.026
	p value	0.890	0.042	
Expectations and actions promoting patient safety	Experimental	12.59 ± 2.60	14.52 ± 2.10	0.001
	Control	12.85 ± 2.68	13.89 ± 1.74	0.08
	p value	0.720	0.236	
Organizational learning	Experimental	8.93 ± 1.95	10.37 ± 1.90	0.001
	Control	9.78 ± 2.41	10.48 ± 2.12	0.060
	p value	0.055	0.840	
Teamwork within units	Experimental	13.59 ± 3.51	15.55 ± 1.87	0.001
	Control	13.30 ± 3.12	14.00 ± 2.60	0.127
	p value	0.745	0.015	
Communication openness	Experimental	8.44 ± 1.60	9.70 ± 1.96	0.002
	Control	7.93 ± 1.44	8.44 ± 1.91	0.219
	p value	0.216	0.020	
Feedback and communication on errors	Experimental	9.74 ± 2.05	10.63 ± 1.73	0.034
	Control	9.70 ± 2.25	10.11 ± 1.85	0.296
	p value	0.950	0.293	
Non-punitive response to errors	Experimental	9.89 ± 2.39	11.44 ± 2.58	0.003
	Control	8.59 ± 2.82	8.96 ± 2.23	0.536
	p value	0.074	0.001	
Staffing	Experimental	9.22 ± 3.59	8.04 ± 2.98	0.045
	Control	8.52 ± 2.85	7.33 ± 2.45	0.002
	p value	0.428	0.348	
Management support for patient safety	Experimental	8.18 ± 1.52	9.22 ± 1.25	0.002
	Control	8.33 ± 1.57	8.59 ± 1.42	0.355
	p value	0.726	0.090	
Teamwork across hospital units	Experimental	12.78 ± 1.42	12.96 ± 1.28	0.631
	Control	12.44 ± 1.09	12.63 ± 1.52	0.434
	p value	0.338	0.389	
Handoffs and transitions	Experimental	12.18 ± 1.69	12.52 ± 1.99	0.462
	Control	11.26 ± 2.85	11.22 ± 1.99	0.921
	p value	0.152	0.021	

SD — standard deviation

Table 4. Comparison of total scores of the patient safety culture before and after the intervention within and between groups

p value (within group)	Post-test; mean (± SD)	Pre-test; mean (± SD)		Variable
0.001	130.44 ± 7.80	123.89 ± 13.60	Experimental	Patient safety
0.35	124.19 ± 8.76	121.83 ± 124.19	Control	culture
	0.001	0.503	p value	

SD — standard deviation