

Open Access
Publish Free

Original Article

The Role of Medical Students in Patient Safety: A Qualitative Study

Shima Naderi¹, Rouhollah Zaboli^{2,3*} , Nader Khalesi⁴, Amir Ashkan Nasiripour⁵

1. PhD Candidate in Health Services Management, Department of Health Services Management, Semnan Branch, Islamic Azad University, Semnan, Iran
2. Associate Professor, Department of Health Services Management, Semnan Branch, Islamic Azad University, Semnan, Iran
3. Associate Professor, Department of Health Services Administration, Faculty of Health, Baqiyatallah University of Medical Sciences, Tehran, Iran
4. Associate Professor, Health Economics Policy Research Center, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran, Tehran, Iran
5. Associate Professor, Department of Health Services Management, Science and Research Branch, Islamic Azad University, Tehran, Iran

Received: 13.06.2019
Accepted: 06.08.2019
Published online: 20.12.2020

***Corresponding Author:**
 Rouhollah Zaboli

Email:
 rouhollah.zaboli@gmail.com

Citation:
 Naderi Sh, Zaboli R, Khalesi N, Nasiripour, A.A. the role of medical students in patient safety: A qualitative study. J Qual Res Health Sci. 2020; 9(3):166-176.

Abstract

Introduction: Patient safety is one of the main components of health services quality which is defined as the prevention of harm to patients during health care provision. Medical students as members of the treatment team play an important role in patient safety. This study aimed to identify the role of medical students in patient safety in medical centers in Semnan province.

Methods: This applied-qualitative study was carried out using a content analysis approach via the framework analysis method. The participants were key informants and experts of patient safety friendly hospital program. They were selected using purposive sampling and the sampling process continued until the data saturation (n=14). The data were collected via semi-structured interviews and analyzed using MAXQDA software (version 10).

Results: Of 468 primary codes, 6 main codes were extracted including *the* importance of student education, student participation in teamwork, interaction with patients, medical errors and patient safety threats, standardization of educational processes, and the importance of completing medical documentation.

Conclusion: The results of this study indicated that students have a broad impact on patient safety. Professors and faculty members can improve patient safety and patient satisfaction by interacting with hospital managers, improving the knowledge and clinical capability of medical students, and reducing the impact of negative factors on patient safety.

Keywords: Patient safety, Patient safety friendly hospital, Student, Content analysis

Introduction

Patient safety is one of the main components of the quality of health services (1) and one of the important issues of the health system and the World Health Organization (2) which

is defined as the prevention and reduction of adverse outcomes and injuries to the patient while providing healthcare services (3). The provision of health services is designed and implemented with the ultimate goal of promoting the health of patients and the community (4). However,



the available statistics show the inadequacy of safety conditions of patient care which leads to harming the patients and threatening their health (5). The important point is that achieving a safe, standard and quality performance and turning safety into a priority and value in the organization is possible only when all members of the organization realize its true importance and institutionalize it in themselves (6) since all staff and health care providers have a very central role in patient safety (3). However, in the current situation, most patient safety programs implemented by various organizations and institutions have targeted physicians, managers, and other health care professionals, and little attention has been paid to medical students who play a vital role in patient safety (7). It should be borne in mind that students may make mistakes due to low experience and skills, lack of sufficient information, the compulsion to do several tasks at the same time, and fatigue caused by intensive classes. Accordingly, they hide their care mistakes due to fear of the consequences of reporting errors and being blamed by instructors and teachers (8) since students possess a low level of knowledge and awareness about patient safety issues and treatment error management (9). Education of medical students focuses solely on medical knowledge, as well as educational and clinical skills and pays very little attention to increasing students' ability in quality improvement, risk management, teamwork, establishing working communication, and collaboration (10). Accordingly, to promote patient safety in educational and medical centers, the World Health Organization in 2009 published a guide to the patient safety curriculum for students (11). In recent years, many studies

have emphasized the importance of incorporating patient safety education topics in the curricula of medical students (8,10,12). However, patient safety education has not yet been included in the educational curriculum of Iranian students and there are major shortcomings with patient safety education for this group of students. It should be noted that educating students can make fundamental changes in their knowledge and beliefs about patient safety and that students' lack of knowledge about patient safety issues and medical errors may lead to harm to the patient and a threat to his/her health (10). Therefore, given that no study in Iran has examined the role of students in patient safety in educational and medical centers, the present study aims to explain the role of medical students in patient safety.

Methods

This qualitative study was conducted using a conventional content analysis method in 2018. The participants were 14 key informants and experts of the patient safety friendly hospital program in Semnan province. The inclusion criteria were having at least 5 years of hospital experience, being familiar with the patient safety-friendly hospital program, and being willing to participate in the study. The participants were selected via purposive sampling. The data were collected through semi-structured interviews conducted individually, in a quiet environment, and at an appropriate time and place upon the agreement of the participants to create a sense of comfort for them. The duration of each interview varied according to different circumstances, with each interview lasting about 80 minutes on average. The interviews were recorded by a voice recorder upon the

participants' permission. Immediately after each interview, all conversations were transcribed, and then the transcript was read and reviewed several times. After codifying the manuscripts and entering the resulting data into MAXQDA.v10 software, the related themes were extracted using a content analysis method based on the framework analysis approach. The data were coded at three levels: first, the meaning units were identified and coded, then the units were classified, and finally, the themes were extracted from extracted categories. Based on thematic relevance, one or several themes and subthemes were identified. To comply with ethical considerations, the participants' identity

information was kept confidential and the interviews were transcribed carefully without any distortion or alteration of the content.

Results

In this study, 11 participants were female and 3 were male. Besides, 2 participants held a bachelor's degree, 8 had a master's degree, 2 had a Ph.D. degree, and 2 were medical doctors. The average work experience of the interviewees was 18.07 years.

Based on the analysis of the interviews about the role of students in patient safety, 468 primary codes, 6 main categories, and 24 subcategories were extracted (Table 1).

Table 1. The themes and subthemes extracted in this study

Themes	Subthemes
The importance of student education	Students' unawareness of quality improvement and patient safety issues Students' unawareness of hospital standards Incorporating patient safety topics into medical curricula Holding theoretical and practical patient safety courses for students
Student participation in teamwork	Promoting a culture of teamwork The sense of contributing to the goals of the hospital Increasing student motivation Teamwork-based learning Students' interaction with the treatment staff
Interaction with patients	Patient education Communicating with patients Patients' satisfaction/dissatisfaction with student participation
Medical errors and patient safety threats	Possibility of errors made by students Students' failure to report errors Lack of a medical error reporting system Students' unawareness of error management processes
Standardization of educational processes	Upgrading the knowledge and ability of professors and instructors Holding training courses for professors and instructors Differences in the performance of professors and instructors The effect of professors' performance on students' behavior Standardizing the number of students in each course Paying attention to educational, treatment, and research programs together
The importance of completing medical documentation	Correct completion of patient records Threats to patients' safety due to defects in medical records

The findings of the study concerning the role of medical students in patient safety were presented in 6 main categories including *the importance of student education, student participation in*

teamwork, interaction with patients, medical errors and patient safety threats, standardization of educational processes, and the importance of completing medical documentation as detailed below:

The importance of student education

The participants in this study acknowledged that medical students are unaware of patient safety concepts and standards, “*Students have no idea what a patient safety program and its standards are and what its purpose is*” (Participant 4). Another interviewee argued, “*Students have very little knowledge of hospital standards. They know nothing about patient safety programs*” (Participant 9). The participants also pointed to holding training courses and incorporating topics related to patient safety to the curriculum for medical students as the most important measures that can be taken to improve student education, “*I think it is better to include a course entitled "Quality Improvement Programs" in the medical curriculum so that students have a rudimentary knowledge of care programs at the time they start working in the hospital*” (Participant 2). “*Students do not receive any education about the programs run in hospitals and they do not know about them*” (Participant 6). Another participant stated, “*Some universities offer workshop and conference courses for their students on patient safety-related programs, which are very helpful in teaching patient safety standards to students*” (Participant 12).

Student participation in teamwork

According to the participants, participation of students as members of the treatment team strengthens learning, teamwork, and participatory culture in the hospital and this can facilitate the process of providing services in hospitals. Examples of the participants’ comments are presented as follows: “*Students are motivated to participate in many therapeutic activities; they feel a sense of belonging to the hospital staff, and try to help the hospital achieve its goals. For example, if students know that the*

hospital is working to improve patient safety, they will do their best” (Participant 1). Another participant stated, “*I believe that if students act individually and do not cooperate with other members of the treatment team, such as doctors, nurses, midwives, etc., they are more likely to commit errors*” (Participant 6).

“*Students must learn teamwork, and this is only possible through interaction with other members of the treatment team. The presence of students in the treatment team both strengthens students' knowledge and skills and facilitates the process of providing medical services*” (Participant 5). Another participant stated, “*Students' membership in the treatment team helps them to communicate with physicians and nurses, and this exchange of information reduces the likelihood of errors and mistakes*” (Participant 13).

Interaction with patients

The participants believed that the presence of students in clinical wards could improve interaction with patients and improve the patient education process. “*Students attend the hospital more frequently than physicians and can spend more time in the ward and on patients' beds, and this can improve communication with the patient*” (Participant 4). Another participant stated, “*Students try to explain to patients about their illness and treatment process in simple language using basic concepts. They strengthen communication with the patient*” (Participant 8). In contrast, another group of the participants stated that in some cases, the presence of students in the ward and their participation in the treatment process affects the quality of services and the full realization of hospital standards and can even cause patient dissatisfaction and threaten their safety. As an example, a participant stated, “*Students' participation*

and cooperation in the implementation of many patient safety standards, such as the correct identification of patients, complete registration of medical records, compliance with standards of proper medication to the patient, etc. are necessary, but a small number of students follow them” (Participant 3). Another participant commented, “During a visit, a patient told me that the students have so long nails that I get annoyed when they examine me. Unfortunately, this is one of the examples of patients' dissatisfaction and the main threat against their safety” (Participant 7). “In our interviews with patients, many of them are dissatisfied with a large number of students present by their bed, but in some cases the patient is right. Initial checking of the patient's medical history by staggers and interns, and visits made by freshman and sophomore medical students, etc. all lead to patient dissatisfaction” (Participant 13).

Medical errors and patient safety threats

A majority of the participants stated that students, like other members of the treatment team, may make mistakes. They believe that student performance in some cases can lead to a threat to patients' safety. Some of the interviewees' comments were as follows: “There are many things that happen to patients including medication errors, patient falls, misidentification of patients, incorrect surgeries and many other things that damage patients' safety. These errors can be made by doctors, nurses, students, and even clinical professors” (Participant 4). “Every human being can make mistakes, but students are more prone to mistakes due to their limited experience and insufficient knowledge” (Participant 7). “The fatigue caused by intensive and consecutive standby shifts increases the likelihood of medical errors for many medical students and

specialist assistants” (Participant 9). “Sometimes students do things that can seriously threaten patients' safety and even endanger their lives” (Participant 12).

The participants believed that students were unaware of hospital error management processes. For example, a participant stated, “A student may make a mistake, but he/she does not know at all that he/she must report it to prevent its subsequent consequences and complications” (Participant 3). Another participant added, “If you right now ask students in the hospital about the process of reporting and analyzing errors or what exactly is a medical error and what should be done about it, you will find out that many of them do not know anything about them” (Participant 11). Another participant argued that “Students may not report their error at all due to fear of the instructor, low semester grades, patient complaints, and so on” (Participant 14).

Standardization of educational processes

The participants pointed out that professors and instructors play a very important role in implementing patient safety standards and achieving the goals of this program. They believed that education and treatment are connected and integrated processes so that the performance of professors and how they treat students and patients, directly and indirectly, affect patient safety. Examples of the participants' comments are as follows, “A professor who does not speak a word to the patient, does not follow the standards of hospital infection control, or does not complete the medical file sheets properly, can't help students in teaching the patient's safety standards?” (Participant 2). “Many doctors and instructors are unaware of the new programs announced to hospitals by the Treatment Department of the Ministry. I think holding training courses for professors

and instructors can be a great help in implementing the standards and achieving the goals of the programs” (Participant 7). Another participant stated, “A physician’s performance is different from another physician. Some physicians only pay attention to the patient’s treatment, while others pay more attention to students’ education. But, in my opinion, education and treatment are not two separate processes as both affect patient safety” (Participant 10).

According to the participants, another aspect of standardizing educational processes is the need to pay attention to the standardization of the number of students in training courses. A participant acknowledged, “There are really a lot of students in the wards: midwifery students, medical students, nursing students, medical emergency students, etc. Medical students do their job in a specific manner, while nursing and midwifery students do their tasks differently. Their presence in the ward sometimes disrupts the organized working procedures in the ward and may interfere with the patient’s treatment” (Participant 5). “One of the professors complained that the number of students is so large that my explanations by the patient’s bed are not heard by all students or sometimes there is not enough space for all students to be in the patients’ room. All these things show the weakness of educational processes that adversely affects both the student and the patient” (Participant 11).

The importance of completing medical documentation

The participants believed that non-compliance with the standards of proper completion of medical documents and patient records is one of the most important reasons for medical errors and injury to patients. For instance, one of the participants stated,

“Instructors should make their students aware that incomplete registration of patient records can lead to medical errors” (Participant 1). “Medical students and assistants should know that recording patient history and clinical examination results determine the course of treatment for patients” (Participant 8). Other interviewees stated, “We have had cases where students’ failure to complete the patient’s medical records has led to errors in the patient’s treatment process” (Participant 10). “Just imagine that a student mistakenly records a dose of medication. This mistake is enough to kill the patient” (Participant 13).

Discussion

The participants in the present study acknowledged that medical students have a low level of knowledge and awareness of how to improve quality and patient safety. They believed that by incorporating issues related to patient safety and managing medical errors in the students’ educational curriculum, it would be possible to improve patient safety in hospitals. The results of the present study were in line with the findings of many studies conducted in Iran and abroad (8-10,12). By incorporating patient safety issues in students’ formal curricula, their importance becomes clear for students, and teaching these issues in complex environments such as hospitals makes it possible to reduce errors (9). In fact, the implementation of patient safety training programs can improve the quality of care, increase patient safety, and reduce adverse and unexpected events (13). Students should know how the health care system works and should be aware of various factors that affect the safety and quality of service delivery in the health system (10).

The participants in the present study pointed

to various aspects of students' presence in clinical wards and their participation in team processes. They stated that the performance of students as members of the treatment team promotes a culture of teamwork and cooperation. It should be noted that medical services are based on communication and teamwork (14) and teamwork in the health system is important for increasing the quality of services and providing safe and effective care (15,16). Improving communication and teamwork can help reduce occupational errors and maintain and improve patient safety (17). In contrast, one of the important factors involved in the occurrence of adverse events is the lack of adequate and effective communication between members of the treatment team (16,18). Poor organizational communication and lack of information exchange in the organization lead to harm to patients (19). Students, as active members of the treatment team, play an important role in the formation of these relationships. Students also consider the role of group work and multidisciplinary teams to be effective in reducing the incidence of errors (12). Besides, the presence of students in the treatment team leads to the formation of a team learning process, strengthening their communication skills, and gaining hands-on knowledge (20).

Another important aspect of students' communication skills is their ability to establish communication with patients. Communicating with the patients and their families is important for establishing a strong relationship and involving them in the treatment process, as well as identifying patients' risks (21). The role that patients can play in promoting patient safety and reducing adverse events is an important global issue (22). Patients' participation and involvement in the treatment process is very

effective in reducing the incidence of errors and promoting the patient's safety culture (14,23). Patient education and their participation in the treatment process affect the promotion of patients' safety and the policy adopted by many countries is to involve more patients in their treatment process (24). Unfortunately, in educational hospitals, both physicians and students do not pay enough attention to patients' rights in terms of communicating with patients and performing clinical interventions, and this has led to patients' dissatisfaction (25).

The participants stated that several factors affect the performance of students in clinical wards and can lead to errors and mistakes by students and consequently threaten the safety of patients. Members of the treatment team, like other human beings, can make mistakes when caring for patients, no matter how skilled, committed, and careful they are. Students may also make mistakes due to limited experience and skills, lack of information, distraction, being forced to do multiple tasks at the same time, fatigue and working long hours, and increasing workload (8,12,26). The results of various studies indicated the commitment of errors and mistakes by students (7,9,27,28). However, the most important point is timely reporting of errors and exploring and finding out their causes to reduce and learn from errors, since the occurrence of medical errors and unwanted medical accidents lead to disability, increasing the length of stay of patients, increasing hospital costs, and reducing the reputation of the hospital (29). However, most students tend to hide their medical errors for fear of the consequences of error reporting, fear of the evaluation score and educational consequences, fear of being punished and reprimanded by the instructor, fear of disgrace, and angering

patients and their attendants (8,27). On the other hand, it should be borne in mind that as students are in the process of forming their professional behaviors and there is no systematic approach to error finding in health care systems, they use personal methods in the face of problems (27). However, steps can be taken to reduce errors and report them promptly by modifying training methods, instructors' control, and using non-punitive strategies. Clinical educators should provide a suitable context and focus on a systemic approach to error reporting by students to report errors and work to remove obstacles (8).

The participants pointed to the importance of different aspects of student education and stated that the observance of educational standards and the knowledge and ability of professors and clinical instructors are very important in medical education. In fact, one of the factors that play an effective role in promoting the level of patient safety in medical centers is teaching the principles and framework of patient safety to medical students by faculty members and clinical instructors (30), since physicians interactively play a major role in treating patients and educating students (10). However, it should be noted that students are not only affected by formal educational programs but also their interaction with professors and instructors, and observing their practical behaviors are effective in shaping students' professional behavior (7). A study by Saberi et al. showed that students considered the professors as their role models and pointed to issues such as talking to the patient and the attendant about the treatment process, treatment options, and the patient's involvement in decision making, professional ethics, and the compliance with forensic issues in case file recording. They also highlighted punctuality and timely

attendance at the patients' bedside, respect for the patients and their rights, confidentiality, obtaining informed consent of the patients or their attendants for medical treatment, preferring the patients' interest over other interests as the most common points they learned from professors (31). It should be noted that clinical education consists of three main components: the physician, students, and the patient. Informing the patient about the role of the student, setting aside time for students to meet patients, and giving the physician time to be alone with the patient are some of the principles that should be taken into account in patient's bedside education. However, students' disregard for patients' rights, patients' fatigue due to examinations and frequent recording of patients' medical records by students, the breach of their privacy due to the disclosure of their illness secrets, and the possibility of serious harm to the patients due to students' practice are downsides of this three-way interaction (25).

The analysis of the participants' statements indicated that another factor affecting patients' safety is the proper registry of patients' medical records. In addition to the members of the treatment team who are responsible for recording information in patients' medical files, students, especially medical students and specialist assistants, also engage in recording information in patients' files. Medical records are a key element in the quality of patient care in terms of documenting the patient's condition, length of hospitalization, examinations performed, the course of the disease, and the interaction between the patient and the physician. Given this significance, accurate, complete, and timely recording of all content of medical records is of particular importance. Studies have shown that the use of various interventions, including

educational interventions, can be effective in increasing the amount of documentation and reducing the number of incomplete files. Physicians and medical professors also consider the quality of documentation of interns and specialized assistants in end-of-course evaluations as one of the mechanisms supporting the registration and promotion of the quality of documentation of medical records (32).

Conclusion

The results of the present study showed the extensive impact of medical students on patient safety. Professors and faculty members of medical universities can interact and cooperate with the management team of hospitals and increase the knowledge, awareness, and clinical ability of students. They can also reduce unwanted therapeutic accidents, improve the safety of patients, and

increase their satisfaction in hospitals by strengthening positive factors such as increasing student participation in quality improvement programs, strengthening the relationship with patients and their families, improving the standards and educational processes of students, and reducing the negative factors affecting the safety of patients.

Acknowledgments

The present study was an excerpt from a doctoral dissertation in health services management at the Islamic Azad University, Semnan Branch, with the ethics code IR.IAU.semnan.REC.1396.5. The authors would like to appreciate all the participants in the present study.

Conflict of Interest: The authors declared no conflict of interest.

References

1. Rajalatchumi A, Ravikumar TS, Muruganandham K, Thulasingam M, Selvaraj K, Reddy MM, et al. Perception of patient safety culture among health-care providers in a tertiary care hospital, South India. *J Nat Sci Biol Med* 2018; 9(1):14-8. doi: 10.4103/jnsbm.JNSBM_86_17.
2. Almasi A, Pourmirza Kalhori R, Ahmadi Jouybari T, Godarzi A, Ahmadi A. Evaluation of patient safety culture in personnel of hospitals in Kermanshah, 2013. *Journal of Clinical Research In Paramedical Sciences* 2015; 4(1):14-23. [In Persian]
3. Hemmat F, Atashzadeh-Shoorideh F, Mehrabi T, Zayeri F. A survey of nurses' awareness of patient safety culture in neonatal intensive care units. *Iran J Nurs Midwifery Res* 2015; 20(4):490-5. doi: 10.4103/1735-9066.161003.
4. Mazhari Z, Adel A. Patient safety status in hospitals of Tehran- patient safety friendly hospitals standards: 2013. *Payavard Salamat* 2015; 8(5):379-89. [In Persian]
5. Sharifi S, Izadi-tame A, Hatamipour K, Sadeghigooghary N, Safabakhsh L. Patient safety culture from Mazandaran clinical nurses' perspective. *Iran Journal of Nursing* 2014; 27(88):77-87. [In Persian]
6. Akbari R, Zarei E, Gholami A, Mousavi H. A survey of patient safety culture: a tool for improving patient safety in healthcare providers service organizations. *Iran Occupational Health* 2015; 12(4): 76-88. [In Persian]
7. Liao JM, Etchegaray JM, Williams ST, Berger DH, Bell SK, Thomas EJ. Assessing medical students' perceptions of patient safety: the medical student safety attitudes and professionalism survey. *Acad Med* 2014; 89(2):343-51. doi: 10.1097/ACM.000000000000124.
8. Azarabad S, Zaman SS, Nouri B, Valiee S. Frequency, causes and reporting barriers of nursing errors in the operating room students. *Research in Medical Education* 2018; 10(2):18-27. [In Persian]

9. Nabilou B, Rasouli J, Khalilzadeh H. Patient safety status in medical education: students perception, knowledg and attitude. *Research in Medical Education* 2013; 5(2):23-31. [In Persian]
10. Abdi Z, Delgoshaei B, Ravaghi H, Heyrani A. Changing medical students' knowledge, skills, and attitudes about patient safety. *HealthMED* 2012; 6(9): 3129-35.
11. World Health Organization. Patient safety curriculum guide for medical schools. [cited 2019 Apr 17] Available from: https://www.who.int/patientsafety/education/curriculum_guide_medical_schools/en/.
12. Kamran R, Bari A, Khan RA, Al-Eraky M. Patient safety awareness among undergraduate medical students in Pakistani medical school. *Pak J Med Sci* 2018; 34(2):305-9. doi: 10.12669/pjms.342.14563.
13. Pakzad N, Norouzi Tabrizi K, Fallahi Khoshknab M, Norouzi M. A comparison of the effect of virtual and lecture-based patient safety education on patient safety culture among nurses. *Qom University of Medical Sciences Journal* 2016; 10(9):27-34. [In Persian]
14. Heyhoe J, Birks Y, Harrison R, O'Hara JK, Cracknell A, Lawton R. The role of emotion in patient safety: are we brave enough to scratch beneath the surface? *J R Soc Med* 2016; 109(2):52-58. doi: 10.1177/0141076815620614.
15. Jafaei Dalooei R, Karimi Moonaghi H, Yamani N, Irajpoor AR, Saadatyar FS. Interprofessional education: the strategy to improve health care. *Research in Medical Education* 2015; 7(1):54-62. [In Persian]
16. Kalantari R, Zakerian SA, Mahmodi Majdabadi M, Zanjirani Farahani A, Meshkati M, Garosi E. Assessing the teamwork among surgical teams of hospitals affiliated to social security organizations in Tehran city. *Journal of Hospital* 2016; 15(3):21-9. [In Persian]
17. Razmara M, Jani M, Moudi A, Sarvari M, Drogar Z, Zolfaghari H, et al. Prioritization of contributing factors on patient safety by analytical hierarchy process. *Nursing Management* 2016; 5(1):70-8. [In Persian]
18. Arshadi Bostanabad M, Jembreili M, Kargari Rezapour M. Patient safety culture assessment in neonatal intensive care units of tabriz from the perspective of nurses in 2013. *Iranian Journal of Nursing Research* 2015; 10(3):26-35. [In Persian]
19. Donaghy C, Doherty R, Irwin T. Patient safety: a culture of openness and supporting staff. *Surgery (Oxford)* 2018; 36(9):509-14. doi:10.1016/j.mpsur.2018.07.005.
20. Hassanzadeh G, Abolhasani F, Mirzazadeh A, Alizadeh M. Team-based learning; a new strategy in integrated medical curriculum: the experience of school of medicine, Tehran University of Medical Sciences. *Iranian Journal of Medical Education* 2013; 13(7):601-10. [In Persian]
21. Groves PS, Manges KA, Scott-Cawiezell J. Handing off safety at the bedside. *Clin Nurs Res* 2016; 25(5):473-93. doi: 10.1177/1054773816630535.
22. Lawton R, O'Hara JK, Sheard L, Armitage G, Cocks K, Buckley H, et al. Can patient involvement improve patient safety? A cluster randomised control trial of the Patient Reporting and Action for a Safe Environment (PRASE) intervention. *BMJ Qual Saf* 2017; 26(8):622-31. doi:10.1136/bmjqs-2016-005570.
23. Wami SD, Demssie AF, Wassie MM, Ahmed AN. Patient safety culture and associated factors: A quantitative and qualitative study of healthcare workers' view in Jimma zone Hospitals, Southwest Ethiopia. *BMC Health Serv Res* 2016; 16:495. doi: 10.1186/s12913-016-1757-z.
24. Ridelberg M, Roback K, Nilsen P. Facilitators and barriers influencing patient safety in Swedish hospitals: a qualitative study of nurses' perceptions. *BMC Nurs* 2014; 13:23. doi: 10.1186/1472-6955-13-23.
25. Abdolmaleki M, Afshar L, Momeni S. Overview on conflict of student and patient's rights in clinical training. *Medical Ethics* 2014; 8(27):115-27. [In Persian]
26. Akbari M, Taheri L, Momeniyan S, Yosefizadeh F. Relationship of nurses' mental workload with patient safety condition in emergency departments of Qom University of Medical Sciences Hospitals, 2017. *Iranian Journal of Emergency Care* 2017; 1(2):67-79. [In Persian]
27. Sarhadi M, Sheikhbardsiri H, Dastras M, Moein H. A Comparative study of barriers to reporting medication errors in nursing students in Zahedan University of Medical Sciences, Iran, in 2013. *Journal of Management And Medical Informatics School* 2014; 2(1):38-46. [In Persian]

28. Gorgich EA, Barfroshan S, Ghoreishi G, Yaghoobi M. Investigating the causes of medication errors and strategies to prevention of them from nurses and nursing student viewpoint. *Glob J Health Sci* 2016; 8(8): 54448. doi: 10.5539/gjhs.v8n8p220.
29. Luiz RB, Simoes AL, Barichello E, Barbosa MH. Factors associated with the patient safety climate at a teaching hospital. *Rev Lat Am Enfermagem* 2015; 23(5):880-7. doi:10.1590/0104-1169.0059.2627.
30. Mostafazadeh F, Asadzadeh F, Rhostamneghad M. Methods of patient safety education for Medical group students. *NAIGO* 2013; 8(1):23-9. [In Persian]
31. Saberi A, Nemati S, Fakhrieh Asl S, Heydarzadeh A, Fahimi A. Education of medical professionalism and the role of educators of Guilan University of Medical Sciences, Iran, according to its residents. *Strides in Development of Medical Education* 2013; 10(2):218-24. [In Persian]
32. Farzandipour M, Zahra Meidani Z, Rangraz Jeddi F, Hamidreza Gilasi H, Shokrizadeh Arani L, Mobarak Z. The Effect of educational intervention on medical diagnosis recording among residents in Kashan University of Medical Sciences. *Iranian Journal of Medical Education* 2012; 12(1):90-8. [In Persian]