

The malpractices of student nurses in clinical practice in Turkey and their causes

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Abstract

Objective: The study was conducted to identify whether or not student nurses made the medical errors as well as the reasons for the errors.

Methods: A study was conducted with 1067 student nurses studying at 12 universities in Turkey. The data were collected by using medical error scale and a questionnaire on demographic characteristics and malpractices.

Results: Overall 28% of the student nurses performed malpractice during clinical practice. Medical errors included failure of complying with sterility and asepsis rules (32%), wrong identification of patient identity (19%), and administrating wrong dosage of medications (12%). They obtained a mean score of 4.19 ± 0.62 from the overall scale and the lowest score was 3.9 ± 0.78 for drug administrations.

Conclusion: Nursing students perform considerable amount of malpractice and they should especially improve concerning administration of drugs.

Keywords: Malpractice; Nurses; Students, Nursing. (JPMA 67: 1198; 2017)

Introduction

Delivery of quality service in the fields of national and international health and patient safety have become increasingly important in recent years. Therefore, prevention or reduction of medical errors or malpractices, which are an important criterion for patient safety, are concerns that should be primarily addressed.^{1,2} Accordingly, all healthcare professionals as well as anyone directly or indirectly providing services to the patient are responsible for the prevention or reduction of medical errors.³

When relevant studies are examined, it is observed that the samples of majority of the studies includes healthcare professionals. In fact, medical errors or malpractices are made not only by healthcare professionals but also students who are future practioners. Additionally, student nurses, who practice at health institutions or clinics to improve their knowledge and skills, provide patient care with trained nurses, and perform diagnoses, tests, and treatments, have a higher risk of engaging in malpractice or making a medical error.⁴ The study of Cebeci et al. supports this view and shows that student nurses made 402 medical errors during clinical practices during one academic period and 39% of these errors were identified by academicians nurses.⁵ In their study, Bodur et al. found that two out of every five students made medical errors, most of these errors were

medication errors, 12% of these errors were injurious or damaged patients, 71% were not reported and they stated that 59% of their intern colleagues also made errors that damaged patients at the rate of 35%, and 89% of these errors were not reported.⁵ Moreover, other studies have also revealed that students mostly made medication errors, supporting these findings.⁵⁻⁷ Accordingly, it is obvious that both healthcare professionals and nursing students can cause conditions induced by medical errors or malpractices include: Death, injury, disability or delay in treatment.⁸ This situation can reduce their learning motivation and success, cause them to be alienated or to withdraw from the profession, to leave the school and quit their jobs in the first years of professional life.⁵ In addition, an insufficient number of nurses is one of reasons for medical errors among nurses, and increased student quotas in nursing schools also result in increases in rates of malpractices. Studies by Karaöz and Karadag et al. state that the number of students and faculties at almost all nursing schools is high; nevertheless, the number of instructors is limited and the workload of nurses is excessive due to the deficiency in the clinical field and an insufficient number of nurses working in the clinic.^{9,10} Similarly, the study conducted by Reid-Searl et al. in Australia, states that nurses did not always supervise students during drug administrations and especially the final-year students are not supervised.¹¹ This situation can cause the student, their instructors, their nursing schools, and the health institutions to face legal problems. Moreover, this can result in increasing the financial burden for the institutions, where the students are clinical practice, by prolonging

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the length of hospital stay as well as leading to conditions such as death and disability among patients and claims for damages. Thus as stated by Alcan et al. medical errors and unexpected incidents causing breach of patient safety should be determined and analyzed to prevent such practices.³ Furthermore, it is required to predetermine situations jeopardizing patient safety and to reduce risks in order to prevent errors. It is also necessary to report risk-bearing situations and errors, reveal their reasons, determine suggestions for solution of the problems and learn from the incidents.^{2,12} In this sense, as mentioned by Akgün and Al-Assaf data and evidence should be collected to show the causes of medical errors in accordance with a systemic approach for development of strategies to solve problems in the healthcare system.¹³ However, as stated by Cebeci et al., there are only a few studies in the literature concerning medical errors by student nurses and the reasons behind these errors.⁵ In their studies, Rodrigue et al. and Mira et al. explained that the number of studies on knowledge of medical and nursing students about the subject and their attitudes towards adverse events is limited.^{14,15} In the study of Vaismoradi et al. curricula of nursing students, who are the practitioners of the future, and their views about teaching strategies or education should be evaluated to provide safety of the service.¹⁶ In this context, this study was planned to determine potential medical errors made by students and the reasons for such errors. Accordingly, it was thought that this study would contribute to the elimination of common errors and risks, to taking necessary precautions related to potential medical errors, and to patient safety. Also this study makes suggestions for administrators of educational and health institutions and for the students.

The purpose of this study was to determine whether student nurses make medical errors in their practices as well as the types and reasons for these errors.

Subjects and Methods

This was a descriptive study since it was conducted to determine errors by student nurses during their clinical practices and the causes of these errors.

The study population comprised of all student nurses studying in nursing departments of universities in Turkey. Sample size was calculated by the formula for unknown population size. This gave a figure of 1067 with 95% confidence level (0.05 significance level). According to the Turkey Statistical Regional Unit Classification, Turkey is divided into 12 regions. A university

representing each region was selected by random sampling method. The total student nurses training in these 12 universities' nursing faculties/departments were 6101. This total number of students were stratified according to the Nursing Faculty/Departments of universities and then according to their year of study at the undergraduate level (2nd, 3rd or 4th year students). Finally, through simple random sampling, 1067 students were selected.

Written permissions were received from rectorships and deanships or directorates of universities between July 2013 and July 2014. Ethics Committee approval of the study was obtained in September 2014. Moreover, participation in the study was on a voluntary basis by the student nurses.

This study was conducted within a project (Number: 114S923) supported by TUBITAK.

Data Collection Tools and Process

A questionnaire composed of 32 questions and a Medical Error Scale (MES) that includes 36 items was used for the study. The data were collected by the researchers by hand between October 2014 and February 2015. The questionnaire recorded the students' demographic characteristics, clinical practices, knowledge of medical errors, status of making medical errors, and reasons of medical errors. The questionnaire was prepared by the authors in line with the literature and seven experts were consulted during the preparation. The MES developed by Öztürk, Kahriman, and Bahcecik in 2014 had seven subscales; falling, blood and blood products transfusion, patient transfer, drug administrations, communication, infection and care practices.¹⁷ Its Cronbach Alpha was 0.92. The scale was developed to determine whether student nurses fulfill safe patient practice during clinical practices or whether they act carefully about medical errors. The scale had a total of 36 items with a 5-point Likert Scale having positive statements. While a score close to 5 in the scale (maximum point 180/36 items=5) signifies a careful approach to medical errors or fulfillment of safe practices, a score close to 1 (minimum point 36/36 items=1) signifies a careless approach or failure of safe practice.¹⁷

Data Analysis

Ages of the students were tested by an average, and their gender, their classes, their participation in a training on patient safety/medical errors, whether they made a medical error or not, if yes, in which classes and in clinics the errors were made, the types of errors-, the reasons for errors and status of reporting errors, injury to patients by

malpractice were tested in terms of frequency and percentage. The number of students per instructor and the scale scores were analyzed by averages. Kolmogorov-Smirnov test was used to test normal distribution of the data and the Kruskal Wallis, Mann Whitney U nonparametric tests were used to compare demographic variables with the scale scores since normal distribution could not be maintained.

Results

Average age of the student nurses in the study was 21.17 ± 1.82 years, 853 (80%) of them were female, 214 (20%) were male, 410 (38%), 378 (36%), and 279 (26%) were the second, third, and fourth-year students respectively. While 724 (68%) did not participate in a training on patient safety/medical errors, 343 (32%) participated.

While 604 (57%) of the students performed clinical practices under supervision of an instructor/guide nurse, 463 (43%) performed clinical practices without an instructor or guide nurse. Although 651 (61%) stated that they did not make any medical error, 300 (28%) declared that they had made malpractices and 116 (11%) did not answer.

The students were asked about their malpractices during their clinical experience, 417 (47%) student nurses expressed that they made these errors within the scope of Fundamentals of Nursing Course; 410 (46%) in the course of Internal Medicine; 221 (25%) in the course of Surgical Diseases; 121 (14%) in the course of Obstetrics and Gynaecology; 103 (12%) in the course of Paediatrics, 33 (4%) in the course of Psychiatry, 33 (4%) in the course of Public Health Nursing, 19 (2%) in the course of Management in Nursing, and 28 (3%) in the other courses (the students were free to select more than one answer and they had their clinical experience at different healthcare organizations). Moreover, 52% of the students made medical errors at University Hospitals, 24% at Training and Research Hospital affiliated with the Ministry of Health, 15% at State Hospitals, 6% at Community and Family Health Centers, and 3% at private hospitals and other institutions. Additionally, 748 (82%) stated that they had made these errors in clinics and departments; 122 (13%) in Intensive Care Units, 108 (12%) in the Emergency Department, 105 (11%) in outpatient clinics; 62 (7%) in operating rooms, and 34 (4%) in Public Health or Family Health Centers.

While 870 (81%) of the students stated that they would report their error; 197 (19%) stated that they would not report these errors; and 634 (60%) also stated that they were afraid of reporting the errors, and 433 (40%) said that they were not afraid.

Primarily, 263 (26%) of the students stated that they made errors due to negligence; 219 (22%) due to way of administration; 85 (8%) due to wrong or false administration; and 75 (7%) due to accident or inattention. In this question also, students were free to select more than one answer. In all 181 (32%) explained that most frequent errors were failure to comply with sterility and asepsis rules; 107 (19%) as wrong identification of patients' identity; and 67 (12%) as administering wrong dosage of medications. While 458 (77%) declared that these errors did not harm the patient, 105 (18%) stated that these errors delayed treatment; 38 (6%) extended the recovery period; 19 (3%) resulted in injury, 15 (2.5%) resulted in disability, and 3 (0.5%) caused death (more than one option was marked).

When reasons for medical malpractices of the students were examined: 778 (74%) of the students explained that the medical errors may be caused by themselves from lack of experience; 663 (61%) by nurses and 539 (53%) by members of medical team by failure of showing a teaching attitude towards the students; 492 (48%) by the system and conditions because of using students due to an insufficient number of nurses; 562 (55%) by instructors due to a large number of students; 684 (67%) by patients and their family due to lack of confidence towards students and lack of communication (Table-1).

According to results obtained from administrative units of the nursing departments of the universities, there was an average of 38 students per instructor at the nursing faculty/department. Additionally, the average number of students per instructor during clinical practice of nursing courses was 33 in the first year, 38-48 in the second year, 27-33 in the third year, and 28-34 in the fourth year of university.

According to MES, the students had a total score of 4.19 ± 0.62 from the scale, and they obtained a score of 4.38 ± 0.73 from the subscale of infection; 4.38 ± 0.8 from the subscale of blood transfusion; 4.31 ± 0.76 from the subscale of communication; 4.25 ± 0.65 from the subscale of care; 4.07 ± 0.79 from the subscale of falling; 4.00 ± 0.89 from the subscale of patient transfer; 3.9 ± 0.78 from the subscale of drug administrations.

When the students' demographic variables and scale scores were compared; there was a statistically significant difference between the years and scale total scores ($\chi^2_{KW} = 12.27$; $p = 0.002$); it was found that this difference was associated with the fact that scale scores of the second-year students were lower compared to third and fourth-year students ($p < 0.05$) (Table-2).

Table-1: All Reasons for student nurses making medical malpractice.

Reasons related to students themselves	n	%
Lack of experience	778	74.0
Lack of professional skills	552	52.5
Lack of professional knowledge	550	52.3
Lack of self-confidence/being afraid of asking questions	485	46.1
Negligence / hurrying	431	41.0
Experiencing too much stress in nursing procedures	412	39.2
Insensitive, uninterested personality and irresponsibility	227	21.6
Not approaching critically / doing everything without questioning	208	19.7
Not liking nursing profession, wanting to leave the school when you get a chance	191	18.1
Being afraid of patients	178	16.9
Reasons related to the nursing profession		
Nursing requires constant attention	663	63.8
Nursing is a tiring profession which requires standing all the time	566	54.4
Nursing covers difficult duties requiring skills	479	46.1
Difference between nursing education and clinical practices	462	44.4
Nurses in constant communication/question-answer for 24 hours	341	32.8
Being continuously interested in patients and problematic individuals and causing emotional exhaustion	297	28.5
Reasons related to trained nurses		
Nurses do not display instructional attitudes towards the students	640	60.9
Negative and adverse attitudes of nurses	591	56.2
Nurses use short and unclear statements	461	43.9
Nurses cannot inform the students sufficiently due to their lack of knowledge	428	40.7
Nurses do not carry out procedures together with the students/they leave the students alone	401	38.1
Nurses do not guide the practices of the students due to reasons such as fatigue	398	37.9
Nurses assign their own works to students and do not supervise them	355	33.8
Nurses use students for works other than nursing	342	32.5
Nurses cannot renew their knowledge/they ask for old or wrong practices from the students	324	30.8
Nurses do not follow/support the students during preparation of drug administrations, etc.	298	28.3
Nurses allow students do some works due to excess amount of workload or patients and do not supervise them	296	28.1
Nurses cannot support the students sufficiently due to their lack of skills	254	24.1
Reasons related to members of the medical team		
They do not display instructional attitudes towards the nursing students	539	52.5
They do not communicate with the students/lack of communication	476	46.3
They prevent the students from carrying out procedures due to lack of confidence	471	45.9
They give unclear statements for their requests	397	38.6
They do not like to be questioned about their decisions/they show fait accompli attitude	374	36.4
They use students in works other than nursing	309	30.1
Giving request/order verbally/ by phone	159	15.5
Reasons related to the system and conditions of the institution		
Students are used in practice due to insufficient number of nurses	492	48.0
No orientation programme is applied for the students in the institution and related service	491	47.9
Unclear limits related to practices of students	366	35.7
No guide booklets are given to the students, which include information about educational goals	355	34.6
Negative physical conditions	265	25.8
Lack of materials or provision of unqualified materials	242	23.6
No/ unclear protocols/procedures	227	22.1
Lack /dysfunction of a system preventing medical errors	226	22.0
Students do internship in the evenings/at night and weekends together with a few nurses	210	20.4
Lack of patient safety culture and practices	184	17.9
Limitation of materials and other sources due to economic reasons	162	15.8
Insufficient/ out-of-date record, communication or documentation system	127	12.3
Reasons related to academicians/instructors		
Failure of carrying out exactly practices due to excess number of students	562	55.0

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They do not carry out procedures together with the students/they leave students alone in internship practices	415	40.6
Showing hard and critical attitudes and discourage questions	384	37.6
Being responsible for more than one clinic	377	36.9
Failure of carrying out practices together with the students due to insufficient number of instructors	357	34.9
Not following/supporting students during preparation of drug administrations, etc.	282	27.6
Lack of professional experience and skills	273	26.7
Tolerating usage of students for works other than the nursing	231	22.6
Lack of professional knowledge	187	18.3
Making students to do internship in the evening and night shifts	176	17.2
Not making explanation the students their duties and responsibilities	146	14.3
Making students to do internship at the weekends	108	10.5
Making students to do internship in the summer	82	8.0
Reasons related to the patients		
Patients/families do not trust the students and do not communicate	684	66.7
Patients are too stressed or anxious	643	62.7
Exaggerated expectations of the patient/family of the student nurse /they are insistent for students to do procedures that they should not do	379	36.9
Failure of carrying out procedures properly based on the disease and severity of the patients	275	26.8
Patients do not comply with treatment and care instructions	261	25.4

*More than one options were marked.

Table-2: Comparison of MES total and subscale scores of the student nurses in terms of the year of training (n= 1067).

Years	Falling		Blood Transfusion		Patient Transfer		Drug		Communication		Infection		Care		Total	
	Median	IQR***	Median	IQR	Median	IQR	Median	IQR	Median	IQR	Median	IQR	Median	IQR	Median	IQR
2nd year	4.13	1.25	4.67	1.17	4	1.20	3.8	1.20	4.4	1.20	4.37	1.0	4.33	1.0	4.26	0.89
3rd year	4.25	1.13	4.83	1.0	4.2	1.40	4	1.20	4.6	1.0	4.4	1.0	4.33	1.0	4.34	0.86
4th year	4.25	1.38	4.83	1.0	4.2	1.60	4	1.0	4.6	1.0	4.37	1.0	4.33	1.0	4.36	0.91
χ^2_{KW} *	$\chi^2_{KW}=1.903$		$\chi^2_{KW}=9.373$		$\chi^2_{KW}=7.176$		$\chi^2_{KW}=17.641$		$\chi^2_{KW}=5.214$		$\chi^2_{KW}=0.039$		$\chi^2_{KW}=20.012$		$\chi^2_{KW}=12.277$	
p value	p=0.386		p= 0.009		p=0.028		p=0.001		p=0.074		p=0.981		p=0.001		p=0.002	
MWU**																
(p<0.05)			2<4		2<4		2<3 and 4						2<3 and 4		2<3 and 4	

*KW= Kruskal Wallis, **MWU= Mann Whitney U, ***IQR=Interquartile Range.

Table-3: Comparison of MES total and subscale scores of the student nurses in terms of having knowledge about medical errors and attending a training/course/seminar (n= 1067).

Attending a training/ course/ seminar	Falling		Blood Transfusion		Patient Transfer		Drug		Communication		Infection		Care		Total	
	Med.**	IQR***	Med.	IQR	Med.	IQR	Med.	IQR	Med.	IQR	Med.	IQR	Med.	IQR	Med.	IQR
Yes	4.25	1.0	5	0.83	4.4	1.20	4.2	1.0	4.8	1.0	4.75	1.0	4.33	1.0	4.44	0.70
No	4.13	1.25	4.67	1.17	4	1.40	4	1.20	4.4	1.20	4.5	1.0	4.33	1.0	4.25	0.93
MWU*	MW = 107547		MWU= 103804		MWU= 100447		MWU= 102495		MWU=102389.5		MWU= 111364		MWU= 99531.5		MWU= 98711	
p value	p=0.001		p=0.001		p=0.001		p=0.001		p=0.001		p=0.005		p=0.001		p=0.001	

*MWU= Mann Whitney U, **Med.= Median, ***IQR=Interquartile Range.

A statistically significant difference was found between organizations, where the students performed practices, and scale total scores ($\chi^2_{KW}=14.06$; $p=0.015$). This difference was caused by the fact that scale scores of the students, who performed practices in Public and Family Health Centers and in other areas with limited nursing interventions, were higher compared to those practicing

in university hospitals, and public hospitals and training-research hospitals affiliated with the Ministry of Health ($p<0.05$).

A statistically significant difference was found between state of students to attend any course or seminar on medical errors and scale scores (MWU=98711; $p=0.001$). This difference was caused by the fact that

scale total scores of the students who attended courses or seminars on medical errors were higher compared to the students who did not attend such courses or seminars (Table-3).

Discussion

The student nurses are large in number, their knowledge and skills are often insufficient and thus are more likely to make in error during their practice. In fact, there are studies indicating that they do make errors. As stated in the studies of Vural et al. and of Eadie, it is first of all necessary to identify medical errors and then learn from them to enhance patient safety and prevention.^{1,18}

This study found that, more than half (57%) of the student nurses, who were on average 21 years old, mostly female and approximately two out of five of whom were second year students, practiced in clinics together with instructors/guide nurses. Therefore, 43% of them performed their clinical practices without an instructor/guide nurse, although there is a regulation stating that students should practice under supervision. Some studies revealed that performance of student nurses in clinical practice is not evaluated sufficiently by the instructors, the students are not allocated enough time, and problems occur due to insufficient number of instructors.^{10,19} This study verifies the results of these previous studies. Although students are normally supervised by nurses during clinical practices, those who are not had a higher possibility of making errors. The results of this study revealed that 28% of the students made malpractice errors and almost half of the students made these errors during practices of nursing courses, which were studied in the first and second years during which their professional knowledge and skills were deficient and inadequate. In clinics and hospitals, where mostly invasive interventions were carried out, too many students performed practices and they were not adequately supervised. According to the results obtained from the scale, the second-year students had lower score on medical errors compared to those in later years and the students performing their clinical practices in Community or Family Health Centers had higher scores than the students performing their practices in the hospitals; which support these results. Results obtained from administrative units of nursing departments of the universities within the scope of the study support this opinion. According to these departments, average number of students per instructor was 38; whereas, average number of students per instructor during clinical practices of nursing courses in the first year when nursing practices should be personally taught to students and where students encounter with nursing practices for the

first time was 33. Excessive number of students per instructor (33-48 students) especially during first and second years courses limits instructors' one-to-one contacts, or performance of joint practices, and their supervision of students thereby increasing the possibility of errors. In the study of Bodur et al., 37% of student nurses all students in the study of Kyrkjebø and Hage, and most of the students in the study of Attree et al. made medical errors.^{5,20,21} Additionally, in the present study, while most of the students stated that they would report their errors, one out of every five students explained that they would not report their errors, and two out of every five students stated that they were afraid of reporting their errors. In their study, Bodur et al. found that 71% of the student nurses did not report their errors and the students were afraid of reporting their errors as is found in the present study.⁴ Cooper also found that most of the students were afraid of accepting their error.²² In the study by Cebeci et al. (2014), the students stated that 49% of the errors were prevented before they reached the patient and the rate of reporting the error to the management was 3.8%.²³

When types of errors made by the students were examined, most frequent errors were, respectively, failing to comply with sterility and asepsis rules, wrong identification of patient identity, and administrating wrong dosage of medications. According to results obtained from the scale, it was determined that the students acted more carefully in the subscale of infection. A contradiction was found between statements of the students and results obtained from the scale. Therefore, it could be asserted that even though they acted carefully concerning infections, they did not comply with sterility and asepsis rules and behaved incorrectly. Similar to results of the present study, some studies revealed that the students did not comply with asepsis rules and made errors.^{5,23} In the study of Ayik et al. it was determined that students did not comply with aseptic technique during dispensing.⁷ As it can be seen, students lacking preventive infection and in performing practices with aseptic techniques. However, it is an obligation to take necessary precautions for protecting patients from infections during interventions and these are the first rules taught during occupational training. Additionally, these results are verified by the reports that nearly one out of every four students made errors due to negligence and one out of every five students made procedural errors. Furthermore, according to the scale, lower scores obtained by the students from the subscale of drug administrations compared to the other subscales indicated that they were prone to making medication errors. In the study of Cebeci et al. with students about errors regarding medication it

was found that the most frequent errors were failure to complying with aseptic technique, administering medicine with appropriate dose, and recording the administered medicine.⁵ Some studies also determined that the most frequent errors were medication errors, testing practices, surgical errors, transfusion errors, and procedural errors.^{13,23,24} In their study Wolf et al. also found concerning medication errors, that doses were often skipped and the medicine was administered in inappropriate dose and at inappropriate time.⁶ Ayik et al. also found that the most frequent errors were as follows: the nurses did not sit up with the patient until he/she swallowed the medicine during oral administration (73.7%), they left the oral drug beside the patient (71.9%), and they administered the drug, prepared by another person, to the patient (70.1%).⁷ In their study, Bodur et al. found that more than half of errors (59%) were medication errors.⁴ In the qualitative study conducted by Reid-Searl et al. with 28 students, it was found that students made medication errors and that the final-year students especially were not always supervised by nurses during drug administrations.¹¹ Additionally, the fact that the students had high scores in the subscale of blood and blood products transfusion according to the scale within the scope of results of the present study was associated with the fact that results of wrong blood/products transfusion practices are fatal and do not tolerate any mistake as stated in the study of Flood and Higbie.²⁵ Therefore, students necessarily act more carefully when dealing with blood and blood products transfusion or students are not left alone during these practices. Again in the study of Flood and Higbie, it was stated that incidence of reactions related to blood/products transfusion was low but life-threatening.²⁵ For this reason, it was emphasized that both nurses and students should communicate efficiently with healthcare professionals for providing optimal patient outcomes, implement appropriate interventions, and identify these reactions immediately.²⁵ High scores obtained by the students in the subscale of infection of the scale could be associated with the fact that studies and practices related to infection control have been paid attention at health institutions recently and have become a culture. This is because students see and learn on site practices related to prevention of infections during clinical practice.

Although it was stated in the study that most of these errors made by the students did not damage the patient, 18% of these errors delayed treatment, and 6% extended the recovery period. Most of the medical errors were caused by the students due to lack of experience; due to failure of displaying correct attitude towards the students by the nurses and members of medical team; by the

system and conditions due to insufficient number of nurses; by instructors due to a large number of students; by patients and their family due to lack of confidence towards students and lack of communication. In their study, Cebeci et al. also stated that most common reasons for the medical errors made by the students were lack of experience, knowledge, and communication as well as violation of rights.⁵ In their study, Bodur et al. also explained that lack of experience, inattention, non-compliance with instructions, lack of team work, excessive number of patients caused frequent errors or an increase in errors.⁴ In case study conducted by Dolansky et al. to analyze the root causes of medication errors by nursing students, it was found that the students made errors due to lack of communication with nurses and clinical instructors, the chaos in the physical environment due to occurrence of errors on the first day especially at service units, staff-related factors based on expectations of students to act as a nursing aide instead of a student, and accordingly students feeling under stress and pressure, differences between the information taught in practice laboratories in schools and practices in hospital departments, educational reasons (such as performing practices including breakfast, baths, patient admission-discharge, diagnostic tests, and patient requests, failure of performing this environment in laboratories or failure of learning every practice in laboratories).²⁶ Additionally, it is recommended that simulation activities in laboratories should be performed during the education of the students, medication calculation should be covered in exercise books and only one patient should be admitted during clinical rotations to prevent errors.²⁶ As is seen, education has an important place in prevention of medical errors. In the study, it was found that the students, who attended a course or seminar on medical errors, had higher scale scores or acted more carefully regarding medical errors, which confirmed this observation.

Conclusion

Errors such as failing to comply with sterility and asepsis rules; wrong identification of patient identity; and administering wrong dosage of medications were overwhelmingly made by students during invasive interventions made at clinics and in their first years when they are inexperienced. Their errors delayed the treatment and extended the recovery period of patients, in certain cases even leading to disability and death. However, students who attended courses or seminars on patient safety and medical errors, and who were informed about medical errors acted more carefully. Thus, it is suggested that students should receive continuous training on these

topics from the first year of their education and they should be more emphasized in the curriculum.

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