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Nursing Students' Levels of Tendency to Commit Medical Errors

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BACKGROUND/AIMS
The determination of nursing students' tendency to commit medical errors and having knowledge about the erroes before they affect patients may ensure taking necessary precautions. The aim of this study was to determine the nursing students' tendency to commit medical errors and the variables that affected it.

MATERIAL and METHODS
This was a cross-sectional study. The sample of the study consisted of 167 nursing students who voluntarily accepted to participate in the study. The Student Identification Form and the Medical Error Tendency in Nursing Scale were used to collect the data. Descriptive statistics, number, percentage, independent t test and ANOVA test were used for statistical analysis by Statistical Package For Social Science 22.0 (IBM Corp.; Armonk, NY, USA) package program.

RESULTS
The mean age of the students was 21.23±2.48 years. 65.3% of them were female, 37.1% of them were second year students. The mean score of the nursing students on the whole Medical Error Tendency in Nursing Scale was 214.71±25.58. Lower dimension score average of the scale was found to be 79.39±9.94 in the "Medication and Transfusion Applications" lower dimension, 53.10±7.07 in the "Prevention of Infections" lower dimension, 38.56±5.24 in the "Patient Follow-Up and Material-Device Safety" lower dimension, 21.67±3.36 in the "Prevention of Falls" lower dimension and 21.97±3.45 in the "Communication" lower dimension. There were statistically significant differences between the students' mean scores on the whole Medical Error Tendency in Nursing Scale according to their grades, and it was observed that the fourth grade students had a statistically lower tendency to commit medical errors compared to the second grade students.

CONCLUSION
In conclusion, it was found that the nursing students' tendency to commit medical errors was low and their grades affected their tendency to commit medical errors.

Keywords: Clinical practice, medical errors, nursing student, tendency to commit medical errors

INTRODUCTION

Nowadays, medical errors, which constitute an important risk for patient safety, have become a multidimensional problem that causes ethical-legal problems related to accidents and deaths (1, 2). A medical error is defined as an inability to complete a planned task as intended or making an incorrect plan to achieve the goal, and a deviation from the patient care process (3). Medical errors are alternatively defined as the practices cause being hospitalized for a longer period of time, deteriorating health of patients and damaging them, or causing death due to ignorance, inexperience, apathy, or used technologies (1, 4, 5).

Medical errors are a growing problem in the field of health. In the literature, it has been reported that medical errors are common in all countries of the world (3, 6-8). In a study conducted by Landrigan et al. (9); it was reported that 0.6% of hospitalizations executed in a group of hospitals in North Carolina for six months, resulted in fatalties and 63% were caused by medical errors.

Medical errors are not only an issue that should not be ignored by all members of health teams, but are also more important for nurses. Because nurses are the members of a profession which spend the most time with patients. In addition,

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incorrect practices adversely affect patient safety since nurses are directly involved in patient care (5). According to the literature, medical errors experienced by nurses are caused by inadequacy of application of care standards, inadequacy in applications related to patient safety and protection, inability in record keeping, carelessness, imprudence, non-compliance with orders and regulations, excessive workload, working by shifts, professional inexperience, inadequate number of nurses, and lack of communication (3, 5, 10, 11).

On the other hand, it is important that nursing students, who are nurse candidates, increase their knowledge and awareness about medical errors during their education (2). It has been emphasized that the problems that are frequently encountered in the professional life should be addressed during the undergraduate education, educators should work for raising nurses who can become aware of the faulty medical practices, find solutions, and the quality of nursing education should be improved (4). Among studies on relevant topics, Türk et al. (2), in a study with intern nurses, found that their tendency to make medical errors was low. In a study by Bodur et al. (12), it was found that midwifery and nursing students had a high rate of medical errors. Cooper (13) emphasized that students without enough clinical experience were at risk of making medical errors in patient care. Çevik et al. (14) reported that the most frequent medical error committed by students during clinical practice was administering medicine prepared for a different patient. Zieber and Williams (15) found that the experience of committing a medical error was traumatic for nursing students on clinical practice, and that the students lacked the skills to cope with the experience. Koohestani and Baghcheghi (16) also emphasized that drug administration errors by nursing students often went unreported.

Teaching safe patient care is one of the essential elements of nursing education. Inadequate skills training and learning process are the main causes of medical errors (2). Today, almost all universities providing nursing degree courses include in their curricula as either compulsory or elective classes information on medical errors and how they can be prevented. However, it should be noted that students with a lack of clinical experience have a high risk of committing unintended error in patient care (2, 17). In line with this information, the probability of committing medical errors of nursing students may increase when they spend most of their time with patients and undertake treatment responsibilities. Therefore, the determination of nursing students' tendency to commit medical errors and having knowledge about the erroes before they affect patients may ensure taking necessary precautions. In the light of this information, the objective of this study was to determine the nursing students' tendency to commit medical errors and the variables that affected it.

Main Points:

- Mean score of the senior students on the Medical Error Tendency in Nursing Scale was significantly higher than that of the second year students.
- There are statistically significant differences between the students' mean scores on the whole METNS according to their grades.
- There is no statistically significant differences between the students mean scores' on the METNS according to gender and high school type variables.

MATERIAL AND METHODS

The universe of this descriptive study consisted of 180 second, third and fourth year students in the Nursing Department of Batman University's School of Health between November and December 2019. First year students were excluded from the study because they did not have any clinical practice experience at the time of the study. The sample of the study consisted of 167 nursing students who voluntarily accepted to participate in the study. Participation in the study was 92.77%. The Student Identification Form and the Medical Error Tendency in Nursing Scale were used to collect the data.

Student Identification Form

This form was created in accordance with the literature (2, 3, 6, 12, 18) by the researchers, and included items on the descriptive characteristics of the students such as age, education year, gender and the type of high school they graduated from.

Medical Error Tendency in Nursing Scale (METNS)

The Medical Error Tendency in Nursing Scale was developed by Özata and Altunkan (18) and its validity and reliability were analyzed by same researchers. It contains 5 sub-scales on the activities of nurses and doctors in the treatment and care process (49 items in total) as the subscales of Medication and Transfusion Applications (18 items), Prevention of Infections (12 items), Patient Follow-up and Material-Device Safety (9 items), Prevention of Falls (5 items), and Communication (5 items). It is a 5-point Likert type scale and the items are scored as 1: never, 2: very rare, 3: occasionally, 4: usually, 5: always. The highest and lowest scores can be obtained from the scale are 245 and 49, respectively. As mean score on the whole scale increases, the tendency of nurses to commit medical errors is interpreted as low (18). In the validity and reliability study of the scale, the Cronbach's alpha coefficient was found to be 0.95. In this study, the Cronbach's alpha coefficient of the scale was calculated as 0.97.

The students informed that all of the collected data would be used for scientific purposes and their answers would not affect their course grades in any way. The questionnaire forms were distributed to the students and collected from the students who completed their answers and then evaluated.

Ethical Considerations

In order to conduct the study, a written permission was obtained from the researcher who developed the scale, and the ethical approval (Decision No. 2019-217) was obtained from the Non-Interventional Clinical Research Ethics Committee of Batman Regional State Hospital. In addition, required legal permissions and informed consents were obtained from the institution and students, respectively.

Statistical Analysis

Descriptive statistics, number, percentage, independent t test and ANOVA test were used for statistical analysis by by Statistical Package For Social Science 22.0 (IBM Corp.; Armonk, NY, USA) package program.

RESULTS

The mean age of the students was 21.23±2.48 years. 65.3% of them were female, 37.1% of them were second year students and 65.9% of them were Anatolian High School graduates (Table 1).

The mean score of the nursing students on the whole METNS was 214.71±25.58. Examining the students' mean MENTS sub-dimension scores, it was seen that their highest mean scores were on "Prevention of Infections", and their lowest mean scores were on "Patient Follow Up and Material-Device Safety" (Table 2).

The descriptive characteristics of the students and their mean scores on the whole METNS are given in Table 3. According to this, there were statistically significant differences between the students' mean scores on the whole METNS according to their grades, and it was observed that the mean score of the senior students on the METNS was significantly higher than that of the second year students ($p<0.05$, Table 3). On the other hand, there was no statistically significant differences between the students mean scores' on the METNS according to gender and high school type variables ($p>0.05$, Table 3).

TABLE 1. Distribution of the descriptive characteristics of the nursing students (n=167)

Characteristics	n	%
Gender		
Female	109	65.3
Male	58	34.7
Grade		
2. year	62	37.1
3. year	47	27.5
4. year	58	35.3
Alma Mater (Type of High School)		
Common High School	32	19.2
Anatolian – Science High School	110	65.9
Other*	25	15.1

*Vocational High School, Religious Vocational High School

TABLE 2. The distribution of the mean scores of the students on the Medical Error Tendency in Nursing Scale (n=167)

METNS Subscales	Min-Max X±SD	Mean Scores X±SD	Item Mean Scores
Medication and Transfusion Applications	48-90	79.39±9.94	4.41±0.55
Prevention of Infections	26-60	53.10±7.07	4.42±0.58
Patient Follow Up and Material-Device Safety	18-45	38.56±5.24	4.28±0.58
Prevention of Falls	10-25	21.67±3.36	4.33±0.67
Communication	9-25	21.97±3.45	4.39±0.69
Total METNS	123-245	214.71±25.58	4.38±0.52

METNS: Medical Error Tendency in Nursing Scale; X: mean; SD: standard deviation

DISCUSSION

The knowledge and experience gained during nursing education affects the competence of students to provide and improve patient safety for care practices (2). It is very important to determine the tendency of nursing students to commit medical errors and to determine the errors before they affect patients. This study was conducted in order to determine the level of tendency of nursing students to commit medical errors and the variables that affect this. In conclusion, it has been seen that the students' tendency level to commit medical errors was low. The low tendency of the students participating in our study to make medical errors is a very welcome finding with regard to developing patient safety procedures. It suggests that students are taking care to avoid medical errors when performing nursing care, and that this may have had an effect on this result. In similar studies conducted by Türk et al. (2) and Güneş et al. (6) with intern nursing students, it was similarly found that the students' tendency to commit medical errors was low.

Similar results have been obtained in most of other studies on nursing students in the literature (14, 19-21). It is a promising finding that the nursing students participating in the study were attentive and careful to ensure patient safety during clinical practice in order to avoid medical errors. However, another study conducted with nursing students reported that one out of five students made a medical error (15). In a study on nursing and midwifery senior students, 37% of midwife and nurse candidates indicated that they made medical mistakes during their training period and more than half of these mistakes (59%) were medication errors (12). Attree et al. (22) reported that all student nurses commit medical errors or encounter errors that were prevented at the last moment. Altuntaş et al. (23) reported that nursing students had low levels of medical error perceptions. In a study conducted by Zaybak et al. (24) on senior students, it was concluded that the students were more likely to commit drug administration errors. Our results are not consistent with these findings. This difference between the results may be due to the differences between the independent variables related to the students in the samples of the studies such as grade, age, curriculum, etc.

TABLE 3. Comparison of the mean scores of the students on the Medical Error Tendency in Nursing Scale according to their descriptive characteristics

Characteristics	METNS X±SD	Statistical Value
Gender		
Female	217.47±20.40	t=1.930
Male	209.51±32.79	p=0.055
Grade		
2. year	207.12±31.06	F=5.576
3. year	215.28±26.75	p=0.005
4. year	222.71±13.58	
Alma Mater (High School Type)		
Common High School	216.12±21.83	F=1.570
Anatolian – Science High School	216.20±23.74	p=0.210
Other	206.36±35.58	

METNS: Medical Error Tendency in Nursing Scale; X: mean; SD: standard deviation; t: Independent t test; F: One-Way ANOVA

Examining the mean scores of nursing department students on the sub-dimensions of MENTS in the conclusion of the study, it was seen that their highest mean score was on the sub-dimension of "Prevention of Infections", and their lowest was on "Patient Follow Up and Material-Device Safety" (Table 2). It is seen from this finding that the tendency to make medical erros was lowest in the sub-dimension of "Prevention of Infections". Similar results were found in studies by Türk et al. (2) and Güneş et al. (6) conducted with nursing department intern students. In a study by Kahriman et al. (19) conducted with nursing students, it was found that the students had the highest scores in the field of infection. It is seen that the results of our study support the results of this study in the literature.

It was found that the fourth grade students had a lower tendency to commit medical errors compared to the other grade students (Table 3). According to this result, we can suggest that as the grade level increases, students' tendency to commit medical errors decreases. The senior students had a lower tendency to commit medical errors, it is an expected finding because senior students are near the completion of the education process and have more experience in terms of clinical practice compared to lower grade students. However, Altuntaş et al. (23) found that the senior students' perceptions of medical errors were lower than the students with lower grades and stated that this finding was surprising and needs to be emphasized. Our results are not similar to the findings of their study.

According to the results, it was found that the variables of gender and high school type did not affect the tendency of the students to commit medical errors (Table 3). Similarly, Güneş et al. (6) and Altuntaş et al. (23) found that the variable of gender did not affect the tendency levels of the students to commit medical errors. Parallel results were also found in similar studies conducted with nurses (3, 20). Our results are consistent with the results of the studies listed above. However, in the study of Türk et al. (2), it was found that gender variable significantly affected the students' tendency to commit medical errors. The results of that study are not similar to the findings of us. It can be suggested that this difference between the results may be due to the difference between the samples because Türk et al. (2) included only senior students in their study. On the other hand, it has been estimated that the students' high school type did not affect their tendency to commit medical errors because most of the students participating in the study graduated from Anatolian and Science High Schools and thus the curriculum differences between their high schools were low.

In conclusion, it was found that the nursing students' tendency to commit medical errors was low and their grades affected their tendency to commit medical errors. It was also observed that gender and type of high school graduated did not affect the level of tendency to commit medical errors. In line with these results, it can be suggested that the knowledge and skills of nursing students on the prevention medical errors should be updated and this study should be repeated in other universities by considering different variables.

There are some limitations in this study. The research was conducted at a single center, the answers to the questions on the forms depended on the students' own statements, and data were collected after a certain time interval. These all constitute limitations to the study.

Ethics Committee Approval: Ethics committee approval was received for this study from Non-Interventional Clinical Research Ethics Committee of Batman Regional State Hospital (2019-217).

Informed Consent: Oral informed consent was obtained from students who participated in this study.

Peer-review: Externally peer-reviewed.

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