

## INVESTIGATION OF THE BEHAVIOUR OF THE NURSING STUDENTS' MEDICAL ERRORS

### HEMŞİRELİK ÖĞRENCİLERİNİN TIBBİ HATALARDA TUTUMLARININ İNCELENMESİ

Gülşen ULAŞ KARAAHMETOĞLU<sup>1</sup>, Havva KAÇAN SOFTA<sup>1</sup>, Tuba SARITAŞ<sup>2</sup>

<sup>1</sup>Kastamonu Üniversitesi Sağlık Bilimleri Fakültesi, Hemşirelik Bölümü

<sup>2</sup>Bursa İnegöl Devlet Hastanesi

**Cite this article as:** Ulaş Karahmetoğlu G, Kaçan Softa H, Saritaş T. Investigation Of The Behaviour Of The Nursing Students' Medical Errors. Med J SDU 2019; 26(4): 472-479.

#### Öz

##### Amaç

Bu çalışma, bir üniversitesinin sağlık yüksekokulunda öğrenim gören hemşirelik bölümü öğrencilerinin tıbbi hatalar konusunda tutumlarının belirlenmesi amacıyla tanımlayıcı-kesitsel olarak yapılmıştır.

##### Gereç ve Yöntem

Araştırmanın evrenini Sağlık Yüksekokulunda öğrenim görmekte olan 380 hemşirelik öğrencisi, örneklemi ise verilerin toplandığı günlerde okulda bulunan ve bilgilendirme sonrası çalışmaya katılmayı kabul eden 340 öğrenci oluşturmuştur. Araştırma verileri, tanıtıcı özellikler anket formu ve Tıbbi Hatalarda Tutum Ölçeği kullanılarak toplanmıştır. Verilerin değerlendirilmesinde sayı ve yüzde dağılımları, ortalama, standart sapma, tek yönlü varyans analizi (ANOVA) bağımsız grup t-testi (Independent Samples t-Test) kullanılmıştır.

##### Bulgular

Araştırmaya katılan öğrencilerin "tıbbi hata algısı" düzeyi  $3.26 \pm 0.76$ ; "tıbbi hata yaklaşımı" düzeyi  $2.09 \pm 0.47$ ; "tıbbi hata nedenleri" düzeyi  $2,08 \pm 0.44$ ; "tıbbi hata genel puan" düzeyi  $2.48 \pm 0.33$  olarak saptanmıştır. Kızların tıbbi hata algısı puanları, erkeklerin puanlarından ve erkeklerin tıbbi hata yaklaşımı puanları, kızların puanlarından yüksek bulunmuştur. Dördüncü sınıfa olanların tıbbi hata algısı puanları, diğer sınıflarda olanların puanlarından yüksek bulun-

muştur. Üçüncü sınıfa olanların tıbbi hata yaklaşımı puanları, birinci ve ikinci sınıfta olanların puanlarından yüksek bulunmuştur. Dördüncü sınıfa olanların tıbbi hata genel puanları, birinci ve ikinci sınıfta olanların puanlarından yüksek bulunmuştur.

##### Sonuç

Bu çalışmada öğrencilerin sadece tıbbi hata algısı düzeyinde olumlu tutuma sahip oldukları belirlenmiştir. Öğrencilerin tıbbi hatalar ve hata bildirim konularında farkındalıklarının artırılması için gerekli eğitimlerin verilmesi önerilmiştir.

**Anahtar Kelimeler :** Tıbbi Hatalar, Hemşirelik Öğrencileri, Tutum.

#### Abstract

##### Objective

This work has been done in order to detect the behaviours of the nursing department students' medical at a medical college of a university as illustrative-segmental.

##### Material and Methods

This work's universe is 380 nursing students at the medical college, and its sample is 340 students who were at the college on those days the data collected and also accepted to attend the work after briefing. The research data were collected with descriptive

İletişim kurulacak yazar/Corresponding author: gulsen@kastamonu.edu.tr

Müracaat tarihi/Application Date: 23.11.2018 • Kabul tarihi/Accepted Date: 22.02.2019

Available online at <http://dergipark.gov.tr/sdutfd>

Makaleye <http://dergipark.gov.tr/sdutfd> web sayfasından ulaşılabilir.

properties, survey form, and Manner Scale on Medical Errors.

## Results

The level of the "medical error perception" of the students who joined to the survey is  $3.26 \pm 0.76$ ; the level of "medical error approach" is  $2.09 \pm 0.47$ ; the level of "medical error general points" is detected as  $2.48 \pm 0.33$ . Medical error perception points of the females were found higher than the males' points, and medical error approach points of males were found higher than the females' points. Medical error perception points of the students at grade 4 were found higher than the other grade students' points. Medical error approach points of the students at grade 4 were

found higher than the first and second grade students' points. Medical error general points of the students at grade 4 were found higher than the first and second grade students' points.

## Conclusion

In this research, it was determined that the students only have positive behaviour the level of medical error perception. It is suggested that the students should get education on awareness on the topics of medical errors and error declaration.

**Keywords:** Medical errors, Nursing students, Behaviour

## Introduction

Medical errors are defined as the events which have developed under the responsibility of medical professionals; can affect the life and medical status of the patient; are unwitting, unwanted and unexpected (1-2).

Medical errors, that affect millions of people in the world every year badly and are among the preferred problems, have to be solved and they are threatening the patient security in both developed and developing countries (3). Moreover, most of the subjects discussed in the patient security content by International Nurses Union were about medical errors (International Council of Nurses 2006). While presenting medical service which is a complicated area, there might be medical errors, and as a result of this; death can be seen as well as injury, disability. Because of that, medical errors are required to be prevented while providing patient security and medical service supply (4). According to the report published by National Medical Institute, 44000-98000 people die because of medical errors in the USA every year, and this number is higher than the number of people who die because of traffic accident, breast cancer or AIDS. Because of wrong medicine application, 1200 people died in England in 2001, and depending on the wrong application the number of death raised 500% in the last ten years (4-5).

In our country, the High Medical Committee which evaluates medical errors reported that there were approximately 10000 files related to medical errors in between 1931-2004, and in the last 5 years, approximately half of the cases were because of the medical staff (1). Moreover, there is a 10% increase in the

lawsuits for medical errors to the nurses in the last 4 years. The reasons of the lawsuits to the nurses are faulty doctor order, medicine errors, wrong or unsuitable material usage, forgetting a material in the patient's body, inadequate patient observation, inadequate communication and patient's dropping down. (2,6).

In order not to confront these types of problems and not to damage the patients, nurses should be careful and professional as much as possible because ignorance, illiteracy, indifference or the applications which cause death or damage the patient or cause to spend long time in the hospital because of the technology used in the surgery are evaluated as medical error (7).

However, there are many factors' effects cannot be neglected aside from the nurseries' control. For instance, these factors increase the possibility of making medical errors in our country; heavy working conditions, emotional stress due to vocational role and responsibilities, intensive care, serving to the patients who are waiting to death, inadequate number of nurses (8).

The medical errors because of these types of factors cause staying in the hospital so long time, increase in mortality and morbidity, the problems between patient/patient relative and medical staff/ institutions as financial and emotional damage. Because of these reasons, the medical staff should care about medical errors. The nurses play key role in medical teams in the method of medical surgery and they play an active role on preventing medical errors. (4).

For these reasons, the importance of medical errors subject should be emphasized in professional nursing

education and awareness on this subject should be made during internship terms. It is so important for the nursing students that they should be informed about medical errors and awareness of them during school years.

The possibility of making mistakes during the internship may be high for the nursing students who deal with the patients, join surgery or serving. Additionally, fearing from the reactions of medical staff and education staff in the institution such as being charged, being punished etc. can bear more bad results because of hiding mistakes they made. For these reasons, to know the behaviour of the students about medical errors is very important to take precautions and to reduce the number of possible problems.

In this research, the aim is to identify the behaviour of making medical errors of the nursing students and to identify how descriptive characteristics (grade, age) affect the behaviour. Moreover, in the literature on medical errors, there is a few research in this area and it is aimed that this research is going to be a data base for the following research on medical errors.

## Material And Method

The research content consists of an application of a Nursing Department of a School of Health at a university. The research was carried out with the 380 nursing students from that college. However, the research was completed by 340 students. Before the application, some information was given such as the aim of the research, voluntariness of participation, the information from participants will not be used apart from this research, anonymousness and their oral confirmations were taken. It was observed that one research application took approximately 15-20 minutes. This research has been done in order to identify the behaviours of the students as illustrative-segmental. The research data were collected by using socio-demographic features survey form and "Behaviour scale on medical errors" developed by Gulec. The scale has 16 parts and 5 likert type which consists of three sub-dimension. If the average of the scale is less than 3, medical error behaviour is negative; if the scale is 3 or more, it is evaluated as positive.

For evaluation of the data, number and percentage distribution, mean, standard deviation, one way analysis of variance (ANOVA), independent group t-test were used.

## Limitations Of The Research

Because of absent students and the students who

don't want to attend the application, the research has been done 89.5% of the universe. The collected data and the assessments are limited to the students' own declaration/personal expressions. Although researchers wanted to reach all universe, the results obtained from the application cannot be generalized because of volunteering principle.

## Hypothesis And Sub-Problems

H1: There is a significant difference between the socio-demographic features and the medical error behaviour scale mean points.

H2: There is a significant difference between the vocational education and experience and the medical error behaviour scale mean points.

## Results

26.5% of the students who participated in the survey were from the grade 4, 39.4% of them were 21-22 years old, 80.6% of them were female, 41.5% of them graduated from Anatolian High School, 81.8% of them had core family, 56.2% of them lived in urban area, 93.2% of them had middle income level, and 42.4% of them expressed that they had middle satisfaction level with their job.

The level of "medical error perception" of the students is  $3.26 \pm 0.76$ ; the level of "medical error approach" is  $2.09 \pm 0.47$ ; the level of "medical error reasons" is  $2.08 \pm 0.44$ ; the level of "medical error general points" is detected as  $2.48 \pm 0.33$  (Table 1).

The difference between the location variable students live and the mean points of medical error approach of the students, medical error reasons, and medical error scale was found statistically significant ( $p < 0.05$ ). In order to determine the differences, a post-hoc analysis was performed; the points of male students living in district were found higher than those living in province. The difference between the means of medical error perceptions and the living area was not found statistically significant ( $p > 0.05$ ) (Table 2).

The difference between the mean points of medical error approach, medical error scale of the students and the satisfaction ratio of having that job variable was found statistically significant ( $p < 0.05$ ).

In order to determine the sources of the differences, a post-hoc analysis was performed. The mean points of the medical error approach of the students who are unsatisfied with their job were found higher than others. The mean points of the medical error approach

of the students who have medium satisfaction were found higher than the students who have high satisfaction. The mean points of medical error scale of the students who are unsatisfied with their job were higher than the students who have less satisfaction, satisfaction and high satisfaction.

The mean points of medical error scale of the students who have medium satisfaction were found higher than the students who are very satisfied with their job. The difference between the mean points of medical error perceptions, medical error reasons and the satisfaction variable was not found statistically significant ( $p>0.05$ ) (Table3).

The difference between the mean points of medical error perception, medical error approach, medical error scale of the students and the grade variable was found statistically significant ( $p<0.05$ ). In order to determine the sources of the differences, a post-hoc analysis was performed. Medical error percep-

tion points of the students who are at grade 4 were found higher than the first and second grade students' points. The mean points of the medical error scale of the students who are at grade 4 were found higher than the first and second grade students' points. The difference between the mean points of medical error reasons and the grade variable was not found statistically significant ( $p>0.05$ ) (Table 4).

The difference between the mean points of medical error perception, medical error approach of the students and the sexuality variable was found statistically significant ( $p<0.05$ ). Medical error perception points of the female students were found higher than the male students' points. Medical error approach points of the male students were found higher than the female students' points.

The difference between the mean points of medical error reasons, medical error scale and the sexuality variable was not found statistically significant ( $p>0.05$ ) (Table 5).

**Table 1** Medical error scale and sub-scale points' mean distribution

	N	Mean	S.D	Min.	Max.
Medical Error Perception	340	3,26	0,76	1	5
Medical Error Approach	340	2,09	0,47	1	3
Medical Error Reasons	340	2,08	0,44	1	4
Medical Error General Points	340	2,48	0,33	1	4

**Table 2** The distribution of the mean points of medical error scale depending on where the students live

	Place of Living	N	Mean	S.D	F	p	Difference
Medical Error Perception	province	191	3,28	0,80	0,305	0,737	
	district	103	3,25	0,67			
	country	46	3,18	0,78			
Medical Error Approach	province	191	2,03	0,44	3,908	<b>0,021</b>	<b>2 &gt; 1</b>
	district	103	2,19	0,48			
	country	46	2,13	0,55			
Medical Error Reasons	province	191	2,03	0,42	3,123	<b>0,045</b>	<b>2 &gt; 1</b>
	district	103	2,14	0,46			
	country	46	2,17	0,45			
Medical Error Scale	province	191	2,45	0,33	4,454	<b>0,012</b>	<b>2 &gt; 1</b>
	district	103	2,52	0,33			
	country	46	2,49	0,33			

Table 3

The distribution of the mean points of medical error scale depending on the students' satisfaction degree

	Satisfaction dergee	N	Mean	Sd	F	p	Difference
Medical Error Perception	unsatisfied	28	3,23	1,10	0,494	0,740	
	less	28	3,20	0,53			
	medium	144	3,26	0,76			
	satisfied	117	3,31	0,73			
	very satisfied	23	3,09	0,63			
Medical Error Approach	unsatisfied	28	2,39	0,40	5,732	<b>0,000</b>	1 > 2 1 > 3 1 > 4 3 > 4 1 > 5 3 > 5
	less	28	2,02	0,37			
	medium	144	2,15	0,48			
	satisfied	117	2,00	0,46			
	very satisfied	23	1,91	0,45			
Medical Error Reasons	unsatisfied	28	2,15	0,51	0,730	0,572	
	less	28	2,02	0,40			
	medium	144	2,10	0,43			
	satisfied	117	2,04	0,42			
	very satisfied	23	2,14	0,56			
Medical Error Scale	unsatisfied	28	2,59	0,50	3,315	<b>0,011</b>	1 > 2 1 > 4 3 > 4 1 > 5
	less	28	2,41	0,34			
	medium	144	2,50	0,32			
	satisfied	117	2,45	0,29			
	very satisfied	23	2,38	0,28			

Table 4

The distribution of the mean points of medical error scale depending on the students' grade

	Grade	N	mean	Sd	F	p	Difference
Medical Error Perception	1	81	3,06	0,70	9,458	<b>0,000</b>	4 > 1 4 > 2 4 > 3
	2	82	3,14	0,68			
	3	87	3,20	0,76			
	4	90	3,60	0,78			
Medical Error Approach		81	2,01	0,44	2,631	<b>0,050</b>	3 > 1 3 > 2
		82	2,04	0,47			
		87	3,19	0,45			
		90	2,11	0,50			
Medical Error Reasons		81	2,09	0,45	1,803	0,146	
		82	2,06	0,45			
		87	2,02	0,46			
		90	2,17	0,39			
Medical Error Scale		81	2,39	0,31	3,716	<b>0,012</b>	4 > 1 4 > 2
		82	2,41	0,33			
		87	2,47	0,36			
		90	2,63	0,25			

**Table 5** The distribution of the mean points of medical error scale depending on the students' sexuality

	Sexuality	N	Mean	Sd	t	P
Medical Error Perception	Male	66	3,00	0,71	-3,116	<b>0,002</b>
	Female	274	3,32	0,76		
Medical Error Approach	Male	66	2,19	0,48	1,977	<b>0,049</b>
	Female	274	2,07	0,47		
Medical Error Reasons	Male	66	2,15	0,51	1,383	0,168
	Female	274	2,07	0,42		
Medical Error Scale	Male	66	2,45	0,40	1,153	0,337
	Female	274	2,48	0,31		

## Discussion

There might be some medical errors during the sup-  
plication of medical service, and these errors may  
cause injury, disability as well as death. It is impor-  
tant to detect medical errors on time and to determine  
their reasons in nursing applications. Therefore, hav-  
ing enough information and detecting the behaviour of  
nurses are so crucial for nurse candidates.

We couldn't find any research in the literature related  
to the behaviour of nurses when they face to medi-  
cal errors. However, according to a research done  
in our country, the tendency of making mistakes of  
nurses was found high and the reason for that was  
determined as lack of vocational information and of  
experience (8). Another research shows that the medi-  
cal error rate of the grade 4 students was found high  
in nursing and tocology students (9). The nurses had  
the lowest mean points in patient observation and  
preventing of dropping down and the security of ma-  
chines according to the researches of Cebeci et al. (1)  
Andsoy et al. had similar results and the lowest mean  
points were found in patient observation and the se-  
curity of machines (10). Additionally, it was reported  
in this research, the possible reasons of medical er-  
rors were being careless, working style, inadequate  
education, less communication, not giving importance  
to the work and lack of motivation. According to a re-  
search by Saygin and Keklik, the most common error  
type is medicine errors. 35% of the medical errors are  
medicine errors, and wrong medicine, injecting wrong  
medicine and wrong application of injection (11). A re-  
search by Cirpi et al., the most common medical error  
in nursing applications is medicine application errors  
with the 57.0 % ratio(12).

The results of these researches increased the impor-  
tance of the evaluation of the behaviour of the medical  
staff on the subject of medical errors. This research  
is going to shed light on the behaviour of the medical  
students in further researches in order to reduce es-  
pecially the errors because of vocational inadequaten-  
ess and inexperience.

The level of the "medical error perception" of the stu-  
dents who joined to the survey was  $3.26 \pm 0.76$ ; the  
level of "medical error approach" was  $2.09 \pm 0.47$ ; the  
level of "medical error general points" was detected as  
 $2.48 \pm 0.33$ (Table 1). Medical error behaviours of the  
nursing students were found negative and it was de-  
tected that medical errors and the importance of error  
declaration were low (13). The researches mentioned  
above and this research show that the students have  
less practice on vocational applications (fundamental  
subjects like medicine, patient observation) during the  
education, so the nurses who start internship or the  
job make many mistakes.

When examined mean points of the medical error ap-  
proach, medical error reasons, medical error scale de-  
pending on where the students live, the mean points  
of the students living in the rural area were higher  
than the students living in the urban area (Table 2).  
The reason of that can be said to be associated with  
the value they give to people, life view and conscious  
of responsibility of students who have grown up in ru-  
ral areas.

When examined mean points of the medical error ap-  
proach, medical error scale depending on satisfaction  
variable, the mean points of medical error approach  
of the unsatisfied students were higher than the oth-  
ers. The mean points of medical error approach of the

students who have medium satisfaction were found higher than the students who are satisfied and very satisfied with their job. The mean points of medical error scale of the students who are unsatisfied with their job were higher than the people who have less satisfaction, satisfaction and high satisfaction. The mean points of medical error scale of the students who have medium satisfaction were found higher than the students who are very satisfied with their job. It can be said it is so sad to see that the mean points of the satisfied students are less than the unsatisfied students in terms of nursing job. There is a contradiction at this application because this situation is not expected that meticulous and sensitive people don't love their job and the people who love their job don't give importance to the subject. However Alan and Khorshdt found that the nurses who love their job have less tendency of making mistakes. This result shows that the people who apply the job don't think like the nursing students. When the students start their career, their responsibilities and conscious might change.

When examined mean points of the medical error perception, medical error approach, medical error scale depending on grade variable, the mean points of medical error perception of the grade 4 students were higher than the others. Medical error perception mean points of the students who are at grade 3 were found higher than the first and second grade students' points. Medical error scale mean points of the students who are at grade 4 were found higher than the first and second grade students' points (Table 4). The application error of using any one else's medicine is frequently done by the grade 2 students, reported by Cevik et al (14). The following mistakes are mostly made by the first grade students; injection to the wrong location, using wrong medicine, applying the medicine to a different person, applying the medicine by an unsterile material, using wrong technique to the ears and eyes, violation of right criteria in medicine application. Ayik et al. also stated that first grade student made so much mistakes than others in violation of right criteria in medicine application (15). It can be stated that the reasons for it might be that the first and second year students have less experience, not taking enough lectures up to now, inadequate adaptation to the internship place and system.

When examined mean points of the medical error perception, medical error approach depending on sexuality variable, the mean points of medical error perception of the female students were higher than the males. Medical error approach points of the male students were found higher than the female students' points (Table 5). Although it is an important result to

be careful about what can cause medical errors and to have enough conscious about the events among female students; because of having low mean points of medical error approach, preventing errors might not be possible. To define the events which might cause errors by the male students will not be able to solve problems although they have good medical error approach.

### Conclusion And Recommendations

In this research, the behaviour points of the students to the medical errors were found negative, and it was stated that students had less awareness on medical errors and the importance of error declaration. The mean points of medical error scale of the students who are from rural area, unsatisfied with the job, at grade 4 were found higher than the others.

In order to increase the awareness of medical errors and the error declaration of the students, a number of suggestions can be put order as; assessment of syllabus of nursing education, to give necessary education in high level on the subject of vocational application from the beginning of the first grade, to increase the number of education staff and tutor staff per student, to supply the possibility of making practice in the labs before the clinic education, to develop students information on medical errors (what are medical errors, reasons, problems can come to existence, precautions), to prepare sources for nursing, to make comprehensive researches on this subject by medical staff and the students.

### References

1. Cebeci F, Gürsoy E, Tekingündüz S. Hemşirelerin Tıbbi Hata Yapma Eğilimlerinin Belirlenmesi, Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi. 2012; 15(3): 188- 96
2. Kabataş SK, Sevinç F, Sav D. Hemşirelerin Tıbbi Hata Yapma Eğilimlerinin İncelenmesi, Uluslararası Hakemli Hemşirelik Araştırmaları Dergisi. 2014;1(2): 59- 74
3. Özata M. Hemşirelerin Tıbbi Hata Yapmaya Eğilimlerinin ve Hasta Bakımında Gösterdikleri Özenin Belirlenmesi, Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi. 2014; 12 (1-2): 417-430
4. İntepeler ŞS, Dursun M. Tıbbi Hatalar ve Tıbbi Hata Bildirim Sistemleri, Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi. 2012; 15(2):129-35
5. Sexton JB, Thomas EJ, Robert L, Helmreich LH. Error, Stress, And Teamwork İn Medicine And Aviation: Cross Sectional Surveys, BMJ. 2000; 320: 745-9
6. Zencirci DA. Hemşirelik ve Hatalı Tıbbi Uygulamalar, Hemşirelikte Araştırma Geliştirme Dergisi. 2010; 1: 67-74
7. Güleç D, Tıbbi Hatalarda Tutum Ölçeğinin Geliştirilmesi, Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü Hemşirelikte Yönetim Yüksek Lisans Tezi. İzmir. (2012). Danışman Öğretim Üyesi: Doç.Dr.Şeyda Seren İntepeler
8. Şahin ZA, Özdemir FK. Hemşirelerin Tıbbi Hata Yapma Eğilimlerinin İncelenmesi, Hemşirelikte Eğitim Ve Araştırma Dergisi. 2015; 12 (3):210-214

9. Bodur S, Filiz E, Çimen A, Kapçı C. Ebelik Ve Hemşirelik Son Sınıf Öğrencilerinin Hasta Güvenliği Ve Tıbbi Hatalar Konusundaki Tutumu, Genel Tıp Dergisi. 2012; 22(2):37-42
10. Andsoy II, Kar G, Öztürk Ö. Hemşirelerin Tıbbi Hata Eğilimlerine Yönelik Bir Çalışma, HSP. 2014; 1(1):17-27
11. Saygın T, Keklik B. Tıbbi Hata Nedenleri Üzerine Bir Araştırma: Isparta İli Örneği, Hacettepe Sağlık İdaresi Dergisi. 2014; 17(2); 99- 118
12. Çırpı F, Merih YD, Kocabey MY. Hasta Güvenliğine Yönelik Hemşirelik Uygulamalarının ve Hemşirelerin Bu Konudaki Görüşlerinin Belirlenmesi, Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi. 2009; 2(3):26- 34
13. Güleç D, ŞS İntepeler. Tıbbi Hatalarda Tutum Ölçeğinin Geliştirilmesi, Hemşirelikte Araştırma Geliştirme Dergisi. 2013; 15(3):26-41
14. Çevik AB, Demirci A, Güven Z. Hemşirelik Öğrencilerinin Klinik Eğitim Sırasında Yaptıkları İlaç Uygulama Hataları ve Tıbbi Hata Farkındalıkları, Acıbadem Üniversitesi Sağlık Bilimleri Dergisi. 2015; 6(3):152-9
15. Ayık G, Özsoy SA, Çetinkaya A. Hemşirelik Öğrencilerinin İlaç Uygulama Hataları, Florence Nightingale Hemşirelik Dergisi. 2010; 18(3):136-43