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HEMŞİRELERİN İLAÇ HATALARININ NEDENLERİNE İLİŞKİN ALGILARI VE HATA NEDENLERİNİ BİLDİRMEME SEBEPLERİNİN İNCELENMESİ

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Öz

Çalışma hemşirelerin ilaç hatalarının nedenlerine yönelik algıları ve hata nedenlerini bildirmeme sebeplerinin incelenmesi amacıyla yapılmıştır. Araştırma Ankara'da Şehir hastanelerinin Çocuk Hastanesi biriminde yapılmış tanımlayıcı bir çalışmadır. Araştırma verileri Haziran-Temmuz 2021 tarihleri arasında toplanmıştır. Araştırmada evreni bilinen örneklem yöntemi kullanılmış ve çalışmaya 287 hemşire katılmıştır. Veriler İlaç Uygulama Hatası Ölçeği ile toplanmıştır. Verilerin analizinde Mann Whitney U testi, Kruskal-Wallis Varyans analizi, basit ve çoklu regresyon analizi kullanılmıştır. Hemşirelerin ilaç uygulama hatalarının oluşma nedenlerine yönelik algıları ve hata bildirimi yapılmama nedenlerinin yönelik algı düzeyleri ölçek toplam puanları ortalamanın üzerinde bulunmuştur. Hemşirelerin ilaç hatası bildirilmeme nedenleri hata oluşma nedenlerini %26,5'ni açıklamaktayken (β=0,517) hata üzerinde anlaşmazlık puanının %30,6'sını açıklamaktadır (β=0,555). Yönetici hemşirelerde ilaç hatalarına yönelik algılar ve hataları bildirmeme düzeyleri servis hemşirelerinden daha düşüktür. Vardiya usulü çalışanların Hata oluşumuna yatkınlık puan ortalaması sürekli gündüz-sürekli gece çalışanların ortalamasından daha yüksektir. İlaç hatalarının nasıl oluştuğu ve hatanın tanımı hemşirelerin ilaç hatası bildirilmeme nedenleri üzerinde etkilidir. Çalışma pozisyonu, ilaç hataları ve bildirilmeme düzeylerini etkilerken çalışma periyotları hata oluşumuna yatkınlığı artırmaktadır.

Anahtar Kelimeler: İlaç Hataları, Olay Bildirimi, Hasta Güvenliği, Hemşirelik.

AN ANALYSIS OF NURSES' PERCEPTIONS ABOUT THE CAUSES OF MEDICATION ERRORS AND OF THE REASONS FOR NOT REPORTING THE CAUSES OF ERRORS

Abstract

The study was conducted to examine nurses' perceptions of the causes of medication errors and their reasons for not reporting the causes of errors. The research is descriptive study conducted in the children's hospital section of the City Hospitals in Ankara. Research data were collected between June and July 2021. In the research, the sampling method with a known population was used and 287 nurses participated in the study. Data were collected using the Medication Administration Error Scale. Mann Whitney U test, Kruskal-Wallis analysis of variance, simple and multiple regression analysis were employed in the analysis of the data. The nurses' perceptions of the causes of drug administration errors and the perception levels of the reasons for not reporting errors were found to be above the average. While the nurses' failure to report medication errors accounts for 26.5% of the causes of error (β=0.517), disagreement over the error for 30.6% of the score (β=0.555). Managerial nurses' perceptions of medication errors and levels of not reporting errors are lower than those of service nurses. The average of susceptibility to error occurrence of shift workers is higher than that of those who work only during the day and at night. How medication errors occur and the definition of the error is effective on the reasons why nurses do not report medication errors. While working position affects drug errors and non-reporting levels, work periods increase the susceptibility to error formation.

Keywords: Medication Errors, Event Reporting, Patient Safety, Nursing.

1. INTRODUCTION

One of the causes of preventable harm in healthcare delivery worldwide is unsafe drug administration and medication errors. According to National Coordinating Council of the United States for Medication Error Reporting and Prevention, "A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer" (1).

It has been reported that the number of deaths due to medication errors in the United States is higher than that of deaths due to AIDS, breast cancer and motor vehicles (2). Incorrect drug administration is an extremely risky issue in terms of the diseases, disabilities and deaths they cause, and it is among the most common error groups that hospitalized patients encounter during their treatment (3,4). According to the study of Elliott et al., it is estimated that 237 million medication errors occur annually in the United Kingdom (5). In a study conducted in Turkey, 46.7% of the participants stated that they or one of their relatives had experienced a medical error, and 34.3% of these were medication administration errors (6). In the meantime, studies that reveal drug errors economically have determined that the cost of errors varies between €2.58 -111727.08 € on average (7).

Medication errors that occur frequently in healthcare delivery can cause serious harm to the patient and even result in the death of the patient. While life-threatening ones of these errors are generally reported, most other errors are ignored (8). Problems in reporting medication errors are a critical situation that health institutions and healthcare professionals face all over the world (9). Nursing as a practice-oriented and evidence-based profession encompasses a wide range of activities aimed at providing quality nursing care. Clinical nursing roles also include drug administration, so drug management has become an integral part of nursing (10). Medication errors can occur at any stage of the medication administration process. Nurses have an important role in reducing and preventing drug administration errors due to the fact that they take part in many stages of the drug administration process, are the highest number in the healthcare team, administer most of the drugs, and are located at the most critical point where the error reaches the patient (11). In a study evaluating the distribution of medication errors according to occupational groups in Turkey in 2018, nurses occupy the first place with an error rate of 43.7% (12).For this reason, determining the perception levels of nurses responsible for drug administration regarding the causes of errors has an important place in studies to develop interventions to reduce errors (13). The responsibility of correct drug administration belongs to more than one person along with the system. Despite all the efforts of a healthcare team, there are many factors that cause drugs not to be administered correctly (8).

In order to understand the causes of medication errors and the reasons for their non-reporting, it is necessary to know the sub-dimensions that make up these factors. These include patients and the public, cultural differences, drugs, systems and drug applications, health professionals and poor lighting, lack of qualified personnel and inadequate number of staff, poorly designed medical devices and related errors, inability to read drug labels, errors in writing, reading or calculating the drug dose and lack of an effective independent dual control system for high-risk drugs (10,14,15).

The "Safety Reporting System (SRS)" created by the Ministry of Health is used in the reporting of medical errors in health services in Turkey. The SRS is a platform where healthcare facilities and healthcare professionals can report errors they encounter in medical processes, and get information about common errors and measures to improve them. The SRS website was put into operation in 2016. Notifications are voluntary. However, the reporting rate of medical errors in Turkey is generally low. In 2017, 101,841 notifications were made to the SRS, 5% of which constitute medication errors (16).In their systematic review, Vrbnjak et al. (17) stated that among the reasons why nurses do not report medication errors and near misses are factors such as fear, personal characteristics and professional competencies, as well as organizational ones such as culture, reporting system and

management behavior. In addition, interruptions in teamwork and cooperation, errors in information transfer, and accepted behavioral norms can also be listed among those reasons (18).

Despite efforts to create medication error reporting systems, it is thought that investigating and examining the underlying factors behind nurses' perceptions of the causes of medication errors and their reasons for not reporting medication errors may increase the success of error reporting systems (19). Therefore, it is very important for every healthcare professional to be informed about the reasons for non-reporting of medication errors, reporting and prevention strategies so that a safe healthcare system can be maintained. The study was conducted to examine nurses' perceptions of the causes of medication errors and the reasons for not reporting the reasons for their errors.

2. MATERIALS AND METHODS

2.1.Sample and Population

This research was carried out in the children's hospital section of the City Hospitals located in the province of Ankara using purposeful sampling method, and nurses who worked in their institution for at least one year were included in the study. The population of the study consisted of 676 nurses working at the Training and Research Hospital of Ministry of Health and the data of the research were collected between June and August 2021.

The sample size was calculated to be 245 according to the sampling method with a known population, which was used in the research. 300 data collection forms were distributed by the researchers to the nurses who volunteered to participate in the research, and the last sample was determined to be 287 nurses after the 13 forms that were left blank, incomplete and incorrectly filled were removed from the collected data forms.

2.2.Data Collection Tool

The research data were collected using the Nurses' Personal and Professional Characteristics Determination Form developed by the researchers conducting this study and the Medication Administration Error Scale (IARS).

The Nurses' Individual and Professional Characteristics Determination Form was developed by the aforementioned researchers and consists of 11 questions in total. In the first part of the form, there were 4 questions prepared to determine the individual characteristics of nurses such as age, gender, marital status, and in the second part, 6 questions prepared to determine the professional characteristics such as working year, type of hospital and department.

The Medication Administration Error Scale (IARS) was developed by Wakefield et al. (20, 21), and the Turkish validity and reliability study of the scale was performed by Arat (22). The original version of the scale consists of 77 items and 4 sections and the first two parts of it were used in our study. There are 29 questions in the first part (Part A), consisting of questions that describe nurses' perceptions of the causes of error. The second part (Part B) consists of 15 questions in which the reasons for the nurses not reporting the causes of error are examined. The scale in which the first two sections are used is a 6-point *Likert type* ranging between "1=strongly disagree" and "6=strongly agree". Scores are taken from each section separately and evaluated separately between sections. The participant can score between 1 and 6 points for each question, so she can get a minimum of 29 and a maximum of 174 points for Part A. As the participant's score for each question increases, the level of being able to cause a medication error for that question item also increases. The participant can get a minimum of 16 and a maximum of 96 points from the second part. As the score obtained by the participant for each question increases, the level of being able to not report an error pertaining to that question item also increases.

In this study, part A scale Cronbach Alpha coefficient total score and sub-dimensions of physician, pharmacy, industry, system and error proneness (0.888, 0.784, 0.829, 0.864, 0.825, and 0.776, respectively) had high reliability. Cronbach Alpha coefficient total score of the B part scale and sub-dimensions of fear, disagreement over error, and administrative response (0.885, 0.823, 0.820, and 0.761, respectively) had high reliability.

Analysis of the Data

The analysis of the research was made using SPSS 20 package program. In cases where parametric test assumptions were not fulfilled, t-test was used for independent samples, Mann Whitney U test for nurses' individual and professional characteristics, and Kruskal-Wallis test was used when there were more than two groups. Simple and multiple linear regression analysis was applied between the scales. $P<0.05$ was accepted for statistical significance.

Ethical Aspect of the Study

The study was approved by Lokman Hekim University Non-Interventional Clinical Research Ethics Committee (Decision no 2020/62 and Code no: 2020058). Written permission was obtained from the hospital administrations where the study was conducted. The nurses who were invited to the study were informed about the study, and those who gave their consent to volunteer were included in the study. The identity information of the nurses was not written in the data collection forms. The research was completed within the framework of the Helsinki Declaration's ethical principles.

3. RESULTS

Table 1 shows the sociodemographic information of the nurses. 287 nurses participated in the study. 84.67% of the nurses are female. The mean age of the nurses is 29.92±7.14. As for the education level of the nurses, it is seen that 82.23% of them undergraduate. 58.89% of them are single, 41.11% are married and 32.06% have children. 66.55% of the nurses chose their profession voluntarily and 33.45% not voluntarily. The duration of working in their profession is between 1-29 years. As for the units they work in, 43.55% in internal medicine. With respect to their working positions, 12.89% of them are nurses in charge and 87.11% of them are service nurses. 64.81% of the nurses work for more than 40 hours, 87.11% work voluntarily in the unit and 78.05% work in shifts.

Table 1. Distribution of nurses by sociodemographic and occupational characteristics

Variables	Number (n)	Percent (%)
Age*	29,92±7,14 (years)	
Gender		
Female	243	84,67
Male	44	15,33
Education		
Health Vocational High School Degree	15	5,23
Associate Degree	12	4,18
Undergraduate Degree	236	82,23
Graduate Degree	19	6,62
Doctorate's Degree	5	1,74
Marital status		
Married	118	41,11
Single	169	58,89
Having children		
Yes	92	32,06
No	195	67,94
Voluntary choice of nursing profession		
Yes	191	66,55
No	96	33,45
Length of time spent in the profession as a nurse**	3 (1-29) (years)	

Unit of work		
Department of Surgery	51	17,77
Internal Medicine	125	43,55
Emergency	13	4,53
Operating Room	2	0,70
Intensive Care	96	33,45
Working position		
Nurse in charge	37	12,89
Service nurse	250	87,11
Weekly working hours		
40 hours	101	35,19
Over 40 hours	186	64,81
Voluntary working in the current unit		
Yes	250	87,11
No	37	12,89
Type of working		
Only daytime	55	19,16
Only nighttime	8	2,79
Shift	224	78,05

* expressed as mean ± standard deviation , ** expressed as median (minimum-maximum)

Table 2 includes descriptive statistics on scale scores. While the average score of the scale of causes of drug administration errors (Part A) was 96.84±18.85, the average score of the scale of reasons for not reporting drug administration errors (Part B) was 52.27±13.88.

Table 2. Distribution of nurses' mean scores of the scale for the causes of medication errors occurring (Part A) and the reasons for not occurring medication errors (Part B) scale

Scale	Mean	Standard Deviation	Minimum	Maximum
Medication administration error scale				
Part A	**96,84**	**18,85**	**29**	**165**
Physician	15,89	4,01	4	24
Information	11,36	4,15	4	23
Pharmacy	8,21	3,37	3	18
Industry	13,23	3,2	3	18
System	24,96	7,86	9	48
Susceptibility to error	15,7	3,21	4	24
Part B	**52,27**	**13,88**	**16**	**87**
Fear	15,24	5,74	5	30
Disagreement over error	19,87	6,61	7	37
Administrative response	12,77	3,68	3	18

Table 3 presents the evaluation of the scale scores according to the sociodemographic characteristics of the individuals. There is no statistically significant difference in the scores of the scale and its sub-dimensions in terms of educational status, marital status, having a child, choosing the nursing profession voluntarily, working unit and working voluntarily in the unit ($p>0.05$). There is a very weak linear negative correlation observed between the scores of the sub-dimensions of age and the susceptibility to error ($r=-0.141$ $p=0.017$). There is a statistically significant difference in the medians of the sub-dimension of susceptibility to error occurrence according to gender ($p<0.05$). The median of male individuals' susceptibility to error is lower than that of females. There is a very weak linear negative correlation between the duration of working as a nurse and the industry sub-dimension scores ($r=-0.125$ $p=0.034$).

In terms of working position, there is a statistically significant difference in the medians of susceptibility to error in Part A, and in those of fear and disagreement over error in Part B ($p<0.05$). In Part A, the median scores of the nurses in charge of being prone to error, fear and disagreement over error are lower than those of service nurses.

There is a statistically significant difference in the average pharmacy score in terms of weekly working hours ($p<0.05$). Pharmacy score average of those working more than 40 hours is higher than that of those working for 40 hours. There is a statistically significant difference in the mean score of susceptibility to error occurrence with regard to type of working ($p<0.05$). The average of susceptibility to error occurrence of shift workers is higher than that of those working only during the day or at night ($p<0.05$).

Table 3. Values of scale scores according to sociodemographic and occupational characteristics of individuals

Variables	Part A		Physician		Information		Pharmacy		Industry		System		susceptibility to error		Part B		Fear		Disagreement over error		Administrative response	
	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value	M ±S.S	Test and p value
Age	r=-0,023	p=0,699	r=0,031	p=0,606	r=0,027	p=0,649	r=0,024	p=0,686	r=-0,076	p=0,197	r=-0,004	p=0,95	**r=-0,141**	**p=0,017**	r=0,01	p=0,87	r=-0,011	p=0,857	r=0,017	p=0,769	r=0,013	p=0,826
Gender								t=-0,226 p=0,822		z=-0,068 p=0,946						z=-0,928 p=0,354		z=-0,957 p=0,338		z=-1,054 p=0,292		z=-0,5 p=0,617
Female	97,38±19,02	t=1,14 p=0,255	15,93±4,05	t=0,412 p=0,681	11,49±4,13	t=1,256 p=0,21	8,19±3,37		14(3-18)		25(9-48)	z=-1,544 p=0,123	16(4-24)	**z=-2,324 p=0,02**	51(16-87)		15(5-30)		19(7-37)		13(3-18)	
Male	93,86±17,8		15,66±3,79		10,64±4,25		8,32±3,42		13,5(7-18)		21,5(11-42)		15(7-20)		49(16-78)		13(5-26)		18(7-31)		13(3-18)	
Education																						
Health Voc School	95(78-142)		18(8-24)		13(6-20)		8(3-17)	K=0,413 p=0,938	13(3-18)	K=7,171 p=0,067	27(14-42)		16(12-20)		64(40-76)	K=5,556 p=0,135	19(7-25)		24(14-37)		13(8-18)	
Associate degree	91,5(71-119)	K=4,175 p=0,243	16(12-19)	K=2,287 p=0,515	10,5(5-18)	K=4,682 p=0,197	8(3-14)		12(8-17)		23(17-40)	K=4,070 p=0,254	15(12-18)	K=4,662 p=0,198	49(32-75)		11(8-24)	K=7,621 p=0,055	19(13-32)	K=4,838 p=0,184	13(6-18)	K=0,376 p=0,945
Undergraduate	97(29-165)		16(4-24)		12(4-22)		8(3-18)		14(3-18)		25(9-48)		16(4-24)		51(16-87)		15(5-30)		19(7-37)		13(3-18)	
Graduate	87(50-135)		15(6-21)		9,5(4-23)		8(3-15)		12(7-18)		21(13-42)		14,5(7-21)		48(22-75)		15(6-26)		18,5(10-30)		12,5(3-18)	
Marital Status																						
Married	97,19±17,02	t=0,264 p=0,792	16(6-24)	z=-1,127 p=0,26	11(4-23)	z=-0,192 p=0,848	8(3-16)	z=-0,809 p=0,419	13,5(3-18)	z=-0,07 p=0,944	24,5(9-47)	z=-0,079 p=0,937	16(4-22)	z=-0,023 p=0,981	51,5(16-87)	z=-0,033 p=0,973	15(5-28)	z=-0,066 p=0,947	19(7-35)	z=-0,136 p=0,892	13(3-18)	z=-0,209 p=0,834
Singe	96,60±20,07		16(4-24)		12(4-22)		7(3-18)		14(3-18)		24(9-48)		15(4-24)		50(16-83)		14(5-30)		19(7-37)		13(3-18)	
Having children																						
Yes	96,21±16,41	t=-0,392 p=0,695	16(6-24)	z=-0,893 p=0,372	11(4-23)	z=-0,338 p=0,735	8(3-17)	z=-0,126 p=0,9	13(3-18)	z=-1,652 p=0,099	25(9-45)	z=-0,723 p=0,47	15(4-22)	z=-1,429 p=0,153	51(16-81)	z=-0,051 p=0,959	15(5-27)	z=-0,073 p=0,942	18(7-34)	z=-0,511 p=0,609	13(3-18)	z=-0,298 p=0,766
No	97,14±19,93		16(4-24)		12(4-22)		8(3-18)		14(3-18)		23(9-48)		16(4-24)		50(16-87)		15(5-30)		19(7-37)		13(3-18)	
Voluntary choice of Nursing profession																						
Yes	97,29±17,88	t=0,570 p=0,569	16(8-24)	z=-1,004 p=0,315	12(4-23)	z=-1,139 p=0,255	8(3-18)	z=-0,118 p=0,906	14(3-18)	z=-0,527 p=0,598	24(9-48)	z=-0,366 p=0,714	16(4-24)	z=-0,557 p=0,577	51(16-83)	z=-0,322 p=0,747	15(5-27)	z=-0,016 p=0,987	19(7-37)	z=-0,407 p=0,684	14(3-18)	z=-0,435 p=0,663
No	95,95±20,72		16(4-24)		11(4-22)		8(3-18)		13(3-18)		24(9-48)		15(4-24)		50(16-87)		15(5-30)		19(7-37)		13(3-18)	
Length of time spent in the profession as a nurse	r=-0,03 p=0,615		r=0,007 p=0,913		r=0,003 p=0,958		r=0,043 p=0,465		**r=-0,125 p=0,034**		r=-0,015 p=0,805		r=-0,11 p=0,064		r=-0,003 p=0,953		r=-0,031 p=0,603		r=0,008 p=0,886		r=0,014 p=0,819	
Unit of work																						
Dept. of Surgery	92(29-141)	K=1,493 p=0,684	16(4-24)	K=2,552 p=0,466	11(4-19)	K=3,705 p=0,295	8(3-15)	K=0,648 p=0,885	13(3-18)	K=2,095 p=0,553	25(9-43)	K=1,372 p=0,712	15(4-24)	K=3,432 p=0,330	49(16-80)	K=1,454 p=0,693	15(5-27)	K=2,644 p=0,450	18(7-35)	K=2,867 p=0,413	13(3-18)	K=0,561 p=0,905
Internal Medicine	96(42-142)		16(6-24)		11(4-23)		8(3-18)		15(6-18)		24(9-48)		16(4-23)		50(16-81)		14(5-27)		18(7-37)		13(3-18)	
Intensive care	95(61-165)		17(4-24)		12(4-21)		7,5(3-18)		13(3-18)		24(11-48)		16(10-24)		53(16-87)		15(5-30)		20(7-36)		13(3-18)	
Others	99(79-131)		16(11-19)		14(7-20)		9(6-17)		13(12-16)		24(19-40)		16(14-21)		49(35-75)		13(10-26)		20(16-32)		13(6-18)	
Working position																						
Nurse in charge	88(50-133)	**z=-2,25 p=0,024**	15(6-24)	z=-1,334 p=0,182	10(4-23)	z=-1,601 p=0,109	8(3-18)	z=-0,106 p=0,915	13(6-18)	z=-0,545 p=0,586	23(12-48)	z=-1,375 p=0,169	14(7-19)	**z=-3,742 p=0**	46(26-75)	**z=-2,794 p=0,005**	12(5-25)	**z=-2,354 p=0,019**	17(7-37)	**z=-2,31 p=0,021**	12(3-18)	z=-1,724 p=0,085
Service nurse	96(29-165)		16(4-24)		12(4-22)		8(3-18)		14(3-18)		24,5(9-48)		16(4-24)		52(16-87)		15(5-30)		19(7-37)		13(3-18)	
Weekly working hours																						
40 hours	94,65±17,31	t=-1,453 p=0,147	15,8±4,25	t=-0,269 p=0,788	11,02±4,18	t=-1,02 p=0,309	7,64±3,14	**t=-2,12 p=0,035**	13,22±3,52	t=-0,061 p=0,952	24,19±7,07	t=-1,23 p=0,22	15,37±3,08	t=-1,287 p=0,199	51,09±13,05	t=-1,06 p=0,29	14,58±5,67	t=-1,422 p=0,156	19,44±6,07	t=-0,835 p=0,404	12,56±3,58	t=-0,685 p=0,494
Over 40 hours	98,03±19,58		15,94±3,89		11,54±4,13		8,52±3,46		13,24±3,03		25,38±8,24		15,88±3,27		52,91±14,31		15,59±5,77		20,12±6,89		12,88±3,74	
Voluntary working in Current unit																						
Yes	95(29-165)	z=-0,448 p=0,654	16(4-24)	z=-0,743 p=0,458	12(4-23)	z=-1,007 p=0,314	8(3-18)	z=-0,462 p=0,644	14(3-18)	z=-1,057 p=0,29	24(9-48)	z=-0,8 p=0,424	16(4-24)	z=-0,309 p=0,758	51,5(16-87)	z=-0,944 p=0,345	15(5-28)	z=-1,627 p=0,104	19(7-37)	z=-0,688 p=0,492	13(3-18)	z=-0,016 p=0,987
No	95(42-125)		16(7-24)		10(4-18)		8(3-14)		15(10-18)		23(9-39)		15(4-23)		49(16-79)		12(5-30)		18(7-35)		13(3-18)	
Type of working																						
Only daytime	94,1±17,47	t=-1,382 p=0,17	15,73±4,18	t=-0,354 p=0,723	11,08±4,44	t=-0,604 p=0,546	8,29±3,22	t=0,195 p=0,846	12,76±3,62	t=-1,324 p=0,187	23,98±7,00	t=-1,211 p=0,228	14,81±2,94	**t=-2,507 p=0,013**	51,52±12,42	t=-0,481 p=0,631	14,73±5,4	t=-0,828 p=0,41	19,67±5,68	t=-0,287 p=0,774	12,75±3,63	t=-0,05 p=0,96
Only night-time	97,62±19,19		15,93±3,97		11,44±4,07		8,19±3,42		13,37±3,07		25,24±8,08		15,95±3,24		52,48±14,29		15,38±5,84		19,94±6,86		12,77±3,7	
Shift																						

Variables that do not show normal distribution are expressed as median (minimum and maximum). t: Independent samples t-test, z=Mann Whitney U test z statistic, K= Kruskal Wallis test test statistic

In Table 4, the effect of perceptions of the reasons for non-reporting of medication errors (Part B) on the perceptions of the causes of medication errors was examined by Simple Linear Regression Analysis. Part B accounts for 26.5% of Part A. A one-point increase in Part B causes an average increase of 0.517 units on Part A (β=0.517).

Table 4. The effect of non-reporting of medication errors on their perceptions of the causes of medication errors

Variable	B	S. Error	β	t	p	Cor. R^2	F	p
Part B	0,702	0,069	0,517	10,200	**<0,001**	0,265	104,041	**<0,001**

Table 5 presents the evaluation of the effects of Part B sub-dimensions on Part A using retrospective variable selection of multiple linear regression analysis. Multiple linear regression analysis ended in the 3rd model and the last model established was found to be significant (F=127,179 p<0.001). The disagreement over error score affects the perception of the causes of medication errors (Part A) and accounts for Part A by 30.6%. A one-point increase in the disagreement over error sub-dimension causes an average increase of 0.555 units on Part A (β=0.555).

Table 5. Effects of Part B sub-dimensions on Part A (Multiple Linear Regression Analysis)

	Variable	B	S. Error	β	t	Sig	Cor. R^2	F	p
Model 1	Fear	-0,026	0,234	-0,008	-0,11	0,913	0,304	42,641	<0,001
	Disagreement over error	1,539	0,203	0,539	7,585	**<0,001**			
	Administrative response	0,294	0,277	0,057	1,061	0,29			
Model 2	Disagreement over error	1,524	0,152	0,534	10,045	**<0,001**	0,306	64,179	<0,001
	Administrative response	0,289	0,272	0,056	1,06	0,29			
Model 3	Disagreement over error	1,585	0,141	0,555	11,277	**<0,001**	0,306	127,179	<0,001

4. DISCUSSION

In the study in which we analyzed nurses' perceptions of the causes of drug administration errors and the reasons for not reporting their errors, the total score obtained by the nurses from the A section was found to be above the average of 96.84±18.85. As for the scale sub-dimensions of the A section, the pharmacy, system and knowledge sub-dimension scores were observed to be low or moderate, while the industry and physician sub-dimension scores were high. While the perception levels of nurses regarding the causes of errors in drug preparation, access to information, use of information and the procedures during application were found to be close to or below the average, their perception level of the causes of errors arising from the problems experienced in drug production and physicians' written/oral drug orders was observed to be above the average.

From the results of the study conducted by Izadpanah et al.(23), it is seen that communication errors in written/oral drug orders, drug-related misapplications in clinical services as well as errors caused by similarities in drug production, are among the causes of drug administration errors. In parallel with ours, in a study conducted among nurses in Nigeria, the ability to access and use information, which is shown among the causes of drug administration errors, has less effect on the factors affecting the occurrence of administration errors (10). In a study conducted in India, the most common medication

errors were found to be incorrect medication administration, incomplete medication dose and medication administration time due to illegible handwriting and drugs with similar names (24). Aslan and Unal stated that factors such as mixing drugs with similar pronunciation and spelling, incomplete and/or wrong physician orders, and incorrect transfer of physician orders to the treatment card may cause medication errors (25). In another study, nurses stated that the most basic causes of medication errors were failure to put the verbal order in writing, incorrect treatment, prescribing contraindicated drugs, the use of abbreviations in the drug name, illegible handwriting, and asking for an incorrect dose (26). Saravi et al. found that 15.9% of medication errors occurred during the preparation/adjustment and 8.7% during the prescribing phase (27). In a study conducted with nurses in Turkey by Cakmak et al., 45.4% of medication errors were found to occur at the stages of request, 20.7% preparation, 11.6% administration, 10.4% preservation, 8.9% transfer and 2.8% post-application . (28). Aslan, who retrospectively analyzed the two-year records of a university hospital in Turkey, found the rate of drug-related incidents to be 24.67%. According to the WHO classification system, 27.1% of these notifications have been found to occur at the order/prescription, 20.8% preparation/dose adjustment, 20.3% follow-up, 19.2% administration and 10.1% storage stages. The research results are similar to those in other studies.

The total score obtained by the nurses from the section B was calculated to be 52.27±13.88. In this regard, it was determined that the sub-dimensions of fear, disagreement over error and administrative response, which are among the reasons why nurses do not report errors in drug administration, are above the average score. Nurses' fear of being blamed and being targeted as a possible reason for the error comes to the fore. Similarly, in a study conducted in South Korea, the error reporting rate ranged from 6.3% to 29.9%. In the study, the primary reason for not reporting medication errors was found to be fear of the negative consequences of reporting the error and subsequent legal actions (30). Tok Yildiz and Yildiz, who examined the recent studies with nurses on medication errors in Turkey, found that 15% of the participants did not report their medication errors during their professional life, but 50.7% witnessed another nurse's, 57.3% a pharmacist's and 46.4% a physician's malpractice, and reported this situation (31).

In the study of Yontem et al., 21.1% of the nurses stated that they never reported any medication errors during their professional life, but 40.3% of them stated that they always reported this situation if they witnessed a medication error made by another nurse, 47.2% by a pharmacist, and 44.5% by a physician. (32). In the study of Aydin et al., 20% of the nurses stated that they did not report a medication error, but 65.8% reported the error of another nurse, 62.3% of a physician, and 76.3% of a pharmacist. In addition, in this study, 44% of the nurses who stated that they did not report medication errors during their nursing career thought that reporting would not work, 28.9% said that they could solve the problem among themselves in case of medication errors, 8.8% had concerns that reporting medication errors would be perceived as personal inadequacy and 9.6% said that they avoided reporting medication errors because they did not know how to report medication errors (33). In the study of Hashemi et al., it was found that the majority of nurses did not report medication errors because they were afraid of being punished after reporting medication errors, it would harm their work life and legal proceedings might be initiated (34).

When the scale scores of the nurses are evaluated according to their professional characteristics, there is a statistically significant difference in the median of the sub-dimensions of the causes of medication errors in terms of working position, the predisposition to error formation, the reasons for not reporting medication errors, and the sub-dimensions of fear and disagreement over error. Part A median scores of nurses in charge for susceptibility to error occurrence, fear and disagreement over error are lower than those of service nurses. Among the reasons for the low score here may be that the manager nurses do not administer medication due to their administrative obligations.

There is a statistically significant difference in the mean score of susceptibility to error occurrence in terms of working type ($p<0.05$). The average of susceptibility to error occurrence of shift workers is higher than that of those who work only during the day and at night. The reason for this may be attention deficit and poor performance due to disruption in sleep patterns. Similarly, Gold et al. reported a strong relationship between shift work and medical errors in nurses, and found that shift nurses made twice as many errors as those working only during the day/only in the evening (35). In a study conducted among nurses in Iran, fear was found to be the most important factor in nurses' reluctance to report medication errors. In addition, factors such as low nurse/patient ratio, excessive workload and fatigue due to overwork were stated to be among the most important factors affecting the incidence of medication errors (36). Similarly, in another study, nurses' knowledge, attention and workload were listed among the most frequently identified causes of medication errors (37). The International Labor Organization (ILO) has recommended that nurses should not work more than 8 hours per day and 40 hours per week (38). In the circular of the Turkish Ministry of Health on working hours of health personnel, it was requested that health personnel work 40 hours a week (39). However, shift nurses are generally known to work overtime and have been the subject of lawsuits (40). In a study conducted on nurses' medication errors in Turkey, it was found that nurses with more than 10 patients made medication errors approximately 2 times more than nurses with 10 or fewer patients (41). In some studies, it has been found that an increase in the number of nurses reduces the workload and therefore medication errors occur less frequently (42,43). The research results are similar to those of ours.

The effects of perceptions on the causes of non-reporting of medication errors on perceptions of the causes of medication errors were analyzed by simple linear regression analysis, and the reasons for non-reporting of medication errors were found to be significant, accounting for the causes of errors by 26.5%. A one-point increase in Part B causes an average increase of 0.517 units on Part A ($\beta=0.517$), suggesting that the cause of the error may prevent reporting the error. The effects of the sub-dimensions of the reasons for not reporting medication errors on the causes of errors were evaluated by multiple linear regression analysis with retrospective variable selection. The disagreement over error score affects the perception of the causes of medication errors and accounts for Part A by 30.6%. A one-point increase in the disagreement over error sub-dimension causes an average increase of 0.555 units on Part A ($\beta=0.555$). This may be due to the fact that the definitions of medication administration errors are not clearly defined or are perceived differently by nurses, lack of information in reporting the error and ignoring the error.

There are some limitations and weaknesses in our study. The research is limited to healthcare staff working in hospitals where the data have been collected. The present study results cannot be generalized to include all healthcare workers in Ankara/Turkey.

5. CONCLUSIONS

It was determined that the scale total score regarding the perceptions of the nurses on the reasons for the occurrence of medication errors and the scale total score on the reasons for not reporting medication errors were found to be above the medium level. The medians of the working position, susceptibility to error, fear and disagreement over the error of the manager nurses are lower than those of the service nurses. The reasons for not reporting medication errors by nurses constitute 26.5% of the reasons for errors. On the other hand, the disagreement score on the error affects the perception score regarding the causes of medication errors and accounts for 30.6% of them. This situation shows that how medication errors occur and the definition of the error is effective on the reasons why nurses do not report medication errors.

In order to reduce medication errors, it is necessary to clearly define the mistakes made in drug administration, to develop drug administration guides and to expand their use among nurses, and by

providing effective guidance of nurse managers to nurses, they should be encouraged to report medication errors in a safe reporting environment to be created.

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