Do nurses follow the "Right Response"? Mixed methods research

Hemşireler ''Doğru Yanıt'' takip ediyor mu? Karma yöntem araştırması

Cevriye Ozdemir[1], Seda Sahan[2]

[1] Department of Medical Services and Techniques, Incesu Ayşe and Saffet Arslan Health Services Vocational School, Kayseri University

[2] Faculty Of Health Science, Izmir Bakircay University

Abstract

Aim: Drug administration and management is an important procedure among clinical nursing practices and is one of the significant indicators affecting patient safety and quality of care. It was aimed to determine the nurses' monitoring of drug effects after drug treatment.

Methods: In the study, sequential explanatory design from exploratory and mixed research methods was used. Quantitative data were collected using a data collection form and qualitative data were collected through in-depth and individual interviews using a semi-structured interview form. The interviews were recorded with a voice recorder.

Results: It was determined that the average age, working years, weekly working hours, and daily number of patients cared for by the nurses were respectively 30.46±6.96, 7.1±6.31, 44.92±5.71, 15.42±11.89 years. It was found that 54.2% of the nurses checked the drug package insert before administering the medication, 74.5% of the nurses always considered the history of drug and food allergy to be of vital importance before drug administration, and 97.9% of the nurses reported unexpected side/toxic effects. As a result of in-depth interviews with the nurses participating in the study, three themes were identified: the approach of right drug administration principles, the approach of following the right response, and the follow-up status of nurses after drug administration.

Conclusion: In the study, it was determined that nurses lacked knowledge about the right medication, and could not implement the right response due to high workload, low number of nurses, and lack of time. It was observed that nurses gave the responsibility of right response follow-up to the patient or the patient's relatives. By evaluating the reasons for not implementing the right response, it is recommended that the number of nurses should be increased, the workload should be regulated, and nurses should receive training on the right drug administration and especially on the importance of the right response. It is also recommended that nurses receive training and counseling on their duties, authorities, and responsibilities.

Keywords: Drug monitoring; drug therapy; nurses

Öz

Amaç: İlaç uygulama ve yönetimi, klinik hemşirelik uygulamaları arasında önemli bir prosedür olup, hasta güvenliğini ve bakım kalitesini etkileyen önemli göstergelerden biridir. Hemşirelerin ilaç uygulaması sonrasında ilaç etkilerini takip etme durumlarının belirlenmesi amaçlanmıştır.

Yöntemler: Araştırmada keşfedici ve karma araştırma yöntemlerinden sıralı açıklayıcı tasarım kullanılmıştır. Araştırmanın nicel verileri veri toplama formu, nitel verileri ise yarı yapılandırılmış görüşme formu kullanılarak Temmuz-Eylül 2023 tarihleri arasında derinlemesine ve bireysel görüşme yöntemi ile toplanmıştır. Yapılan görüşmeler ses kayıt cihazı ile kayıt edilmiştir.

Bulgular: Hemşirelerin yaş, çalışma yılı, haftalık çalışma saati ve günlük bakılan hasta sayıları ortalamalarının sırasıyla 30.46±6.96, 7.1±6.31, 44.92±5.71, 15.42±11.89 yıl olduğu belirlendi. Hemşirelerin %54.2'si ilaç uygulamalarını yapmadan önce ilaç prospektüsünü kontrol ettiği, %74.5'inin ilaç uygulama öncesinde ilaç ve besin alerjisi öyküsünü her zaman hayati önemi olan bir durum olduğunu düşündüğü, %97.9'unun beklenmeyen yan/toksik etkileri bildirdiği saptandı. Araştırmaya katılan hemşireler ile yapılan derinlemesine görüşmeler sonucunda ise doğru ilaç uygulama ilkeleri yaklaşımı, doğru yanıt takip etme yaklaşımı ve hemşirelerin ilaç uygulama sonrası takip etme durumları olmak üzere üç tema belirlenmiştir.

Sonuç: Çalışmada, hemşirelerin doğru ilaç uygulama ilkeleri konusunda bilgi eksikliği olduğu, iş yükünün fazla olması, hemşire sayısının az olması ve zaman yetersizliği nedenleriyle doğru yanıt ilkesini uygulayamadıkları belirlenmiştir. Hemşirelerin, doğru yanıt takibinin sorumluluğunu hasta veya hasta yakınına verdiği görülmüştür. Doğru yanıt ilkesinin uygulanmama nedenleri değerlendirilerek, hemşire sayısının artırılması, iş yükünün düzenlenmesi, hemşirelerin doğru ilaç uygulama ilkeleri konusunda ve özellikle doğru yanıtın önemi konusunda eğitimler alması önerilmektedir. Ayrıca hemşirelerin görev, yetki ve sorumlulukları konusunda da eğitim ve danışmanlık alması da önerilerimiz arasında yerini almaktadır.

Anahtar Sözcükler: Hemşireler; ilaç takibi; ilaç tedavisi

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Corresponding author/*Yazışma yazarı*

Cevriye Ozdemir

Kayseri Üniversitesi, İncesu Ayşe ve Saffet Arslan Sağlık Hizmetleri Meslek Yüksekokulu, Tıbbi Hizmetler ve Teknikler Bölümü, Kayseri, Türkiye.
E-mail: cevriyeozdemir@kayseri.edu.tr

ORCID
Cevriye Ozdemir: 0000-0002-9401-0044
Seda Sahan: 0000-0003-4071-2742

INTRODUCTION

Nurses have a unique role and responsibility in medication management, namely since they are usually the last person to check that the medication is correctly prescribed and administered, prior to administration. Likewise, nurses are the primary health personnel who will follow up on the treatment after the medication is administered (1,2). Medication management is a basic nursing skill and it is the responsibility of nurses to perform it safely and effectively (3).

During nursing education, topics to support clinical medication management and patient safety, known as the 'ten rights' of medication administration, are included in the curriculum content. These 'rights' are the right patient, right drug, right time, right dose, right route, right refusal, right information/understanding, right assessment/response, and right record (4–6). Among these rights, there are various studies in the literature on correct patient, drug, time, dose, route, and registration (4,5,7). However, there is a gap in the literature on the correct response or correct evaluation after medication administration. Medication management is a process and how this process ends is the responsibility of healthcare professionals (8). Nurses in particular, who are in closest communication with patients/healthy individuals, have a great responsibility at this point (9). This study aimed to determine the status of nurses in clinics to follow the right response / right evaluation following drug administration.

When individuals are admitted to the hospital, they expect to be treated for their diseases and to receive quality nursing care. Patient safety and quality of care are essential elements of clinical nursing practices. Medication therapy and management is an important procedure among clinical nursing practices and is one of the significant indicators affecting patient safety and quality of careMetin girmek için buraya tıklayın veya dokunun. and it is one of the main responsibilities of nurses (10). Nurses around the world are educationally prepared, morally responsible and professionally accountable to fulfill their roles safely (9). However, nurses face various challenges in safe medication administration in the delivery of healthcare to patients (7,8). Most nurses are taught safe medication administration using a framework known as the 'ten rights', which is a globally accepted guideline for safe medication management practice (11).

In addition to being included in nursing functions, drug administration is a process that involves a number of disciplines. It is initiated with the order given by the physician after the examination of the patient and ends with the administration of the drug by the nurse, with the doctor, the patient, or his/her relatives, recording and observing the correct response. The nurse should have pharmacologic knowledge about drugs, be able to make decisions about the precautions and interventions to be taken and be able to take responsibility for these. The nurse will minimize the possibility of error by fulfilling her/his roles and responsibilities regarding the administration of medications (12). The World Health Organization (WHO) ranked medication errors as the second most common cause of adverse health events (18.3%). Medication errors are a leading risk to patients, and their annual global cost is estimated at US$42 billion (6,13). Medication error is the most common type of error affecting patient safety and the most common type of error among medical errors (13). In order to minimize medication errors, attention should be paid to the "rights" in medication administration. One of these is "right effect/response" and to the best of our knowledge, no study exists on correct response monitoring in the literature. As only a handful of studies have been published on the rights of correct drug administration/drug rights, this study aimed to determine the nurses' monitoring of drug effects after drug administration.

The following question was sought to be answered in the research.

- Do nurses follow the "right response"?

MATERIAL AND METHODS

Design

In the study, a sequential explanatory design from exploratory and mixed research methods, including qualitative and quantitative methods, was used to determine the nurses' monitoring of drug effects following drug administration (Figure 1).

Study setting and sampling

Sequential explanatory design, one of the mixed research methods, involves collecting quantitative and qualitative data at various times and sequentially, to

examine the same event. This design is a mixed method design in which quantitative data are collected first and then a second phase is used to seek specific results. This type of mixed-method study aims to reach statistical quantitative results from a sample and then to examine these results in more detail with persons selected from the participants in line with the criteria determined (14,15).

The population of the study consisted of 205 nurses working in two state hospitals. Post hoc power analysis was performed and accordingly, when effect size: 0.50, n: 92, and alpha: 0.05 were calculated, the study power was determined as 95%. Five persons on annual leave and eight persons who did not volunteer to participate in the study were excluded from the sample. The quantitative part of the study was conducted with 192 nurses.

The sample of the qualitative part of the study was determined by "criterion sampling" which is one of the subcategories of the purposive sampling method, after analyzing the data obtained from the data collection form results of the participants. The criterion for collecting qualitative data was determined as "performing drug administration" of the nurses participating in the study. In-depth interviews were conducted with the nurses who volunteered to participate in the interview. Consideration was given to ensure that the nurses to be interviewed had the highest number of drug administration procedures, were able to follow the patient after the procedure, and were age-diverse. Since there is no definite rule in qualitative research such as interviewing a certain percentage of the entire sample, a purposive sampling method was used. In qualitative research conducted in the field of health sciences, reaching data saturation is expressed as the "gold standard" in determining the purposeful sample size (16). Based on this criterion, it was thought that a sample size of 5 to 20 persons would be sufficient to reach saturation in the answers given to the questions. According to this purposive sampling method, when there were no new answers to the questions asked, the data collection process was terminated when the answers began to be repeated, that is, when the saturation point was reached, and the research was completed with 12 nurses (16). The characteristics of the nurses interviewed are provided in Table 1.

Data collection

The data was collected through face-to-face interviews between July and September 2023. Quantitative data were collected during July and qualitative data were collected during August and September. Interviews were conducted at the convenience of the participants in the areas of their choice, and the interviews lasted 25 to 30 minutes. During data collection, both instant notes were taken and voice recordings were made to prevent data loss. The tools used in the quantitative and qualitative phases of the study were created by the researchers by reviewing the relevant literature and collecting opinions from six experts in the field of nursing and statistics. A "Data collection form" was used in the quantitative phase and "a semi-structured" interview form was used in the qualitative phase.

Data collection form: The form includes a total of ten questions, including seven questions about the descriptive characteristics of the participants (age, gender, educational status, years of employment, clinic of employment, weekly working hours, number of patients cared daily) and three questions about medication practices.

Semi-structured interview form: Qualitative data were collected through "individual in-depth interviews." The method is a data collection tool that enables individuals to reveal their experiences, opinions, complaints, feelings, and beliefs, and the factors that guide their behavior (16). The reason for using the interview technique in this study was to obtain in-depth information from the participants about monitoring the effects of drug administration. Cohen et al. stated that comparable and reliable qualitative data can be collected through semi-structured interviews (14). In this interview form, there are three open-ended questions about monitoring the effects of drug administration. The questions in the semi-structured interview form were as follows:

- What do you think is the right to administer medicines correctly?
- What do you do to follow up on the positive or negative effects after administering medication to your patients?
- What are your thoughts about nurses' follow-up of the correct response?

Ethical approval

This study was started after the ethical approval of the study was obtained from Kayseri University Ethics Committee (Date: 05.05.2023, Decision No: 31/2023). Informed consent was obtained from all participants and they were informed about the purpose and content of the study. In addition, pre-interview consent was obtained from the interviewed nurses for audio recording. The study was conducted in accordance with the principles of the Declaration of Helsinki from the research design to the publication process.

Statistical analysis

Quantitative data was evaluated using the IBM SPSS 23 Statistics (IBM Corp., Armonk, New York, USA) package program. Quantitative and qualitative methods were used to analyze the data. Number, percentage and mean were used as descriptive statistics in the analysis of quantitative data.

For qualitative interviews, thematic analysis was used to analyze the interview transcripts following the process described by Braun and Clarke (2021) (17). The audio recordings taken during the interviews were transcribed by a researcher. Braun and Clarke's six-stage thematic analysis method was then used. In the first stage, the researchers read and reread each interview to understand its content and get an overall perspective. In the second stage, first impressions and perceived similarities and differences were recorded. In the third stage, the data were systematically broken down into meaningful codes. In the fourth step, these initial codes were noted down and revisited, thus making the codes visible. In the fifth step, the coded data were advanced to thematic map making, where the researchers evaluated the adjustment of themes and sub-themes. In the sixth and final step, each theme was analytically refined and linked to the literature to provide clear definitions for each theme and sub-theme.

RESULTS

The findings obtained from the study conducted to determine the nurses' monitoring of drug effects after drug administration were examined under two headings: quantitative and qualitative sections.

Findings related to the quantitative portion of the study

When the descriptive characteristics of the nurses were examined, it was determined that the mean ages, working year, weekly working hours, and number of patients given daily care, were respectively 30.46±6.96 years, 7.1±6.31 years, 44.92±5.71 hours, 15.42±11.89 years. It was found that 54.2% of the nurses checked the drug package insert before administering medication, 74.5% always took the history of drug and food allergy before drug administration because they thought that it was a vital condition, and 97.9% reported unexpected side/toxic effects (Table 2).

Findings related to the qualitative part of the study

The qualitative data of the study was analyzed independently by the researcher and two instructors from the nursing department, and then divided into themes. After in-depth interviews with twelve nurses, qualitative findings consisting of themes and sub-themes were presented under the following headings under three main themes (Figure 2).

Theme 1: Rights approach to correct medication administration

In response to the question "What do you think are the rights of correct drug administration?" the nurses mainly tried to list the rights. In the interviews, some of the nurses defined the approach to the right to administer medication according to the physician's order (N4, N7), some of them mentioned the right to administer medication (N1, N3, N6, N8) and some mentioned both the physician's order and the right to administer medication (N2, N9, N12).

Subtheme 1.1: Approach according to physician's order

Regarding the right to administer medication correctly, nurses first stated that it should be done according to the physician's order. Examples of nurses' statements "according to the physician's order" are given below.

N4: *"To apply it as it should be applied by following the order written by the physician, to adjust the dose of the drug well and apply it to the patient correctly"*

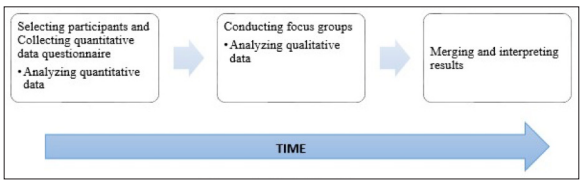

Figure 1. Study flow diagram

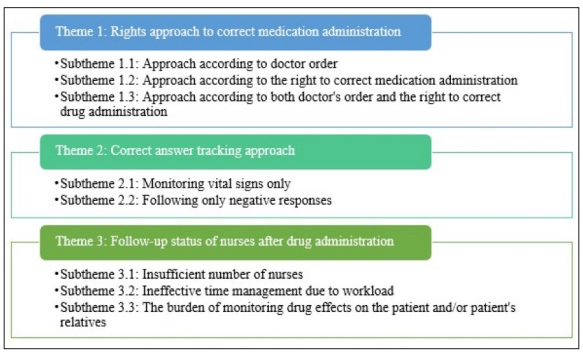

Figure 2. Overview of themes and sub-themes

N7: *"After the examination of the patient, the doctor gives the order, the drug is brought from the pharmacy, the drug is administered to the patient in a controlled manner and then the effects are observed."*

Subtheme 1.2: Approach according to the right to correct medication administration

A number of nurses mentioned the right to administer the correct medication other than the physician's order; some examples of the participants' statements about "the right to administer the correct medication" are given below.

N1: *"I remember the right dose, the right medicine, the right patient, the right time. I think it was eight rights."*

N3: *"To adjust the dose of the drug well and administer it correctly by confirming the patient, the most important thing is to adjust the dose of the drug well."*

N6: *"To administer the right medicine to the right patient at the right time in the right route and dose."*

N8: *"Right drug, right dose, right patient, right time, right route, right form of medication, right record, right response."*

Subtheme 1.3: Approach according to both physician's order and the right to correct drug administration

Among the nurses who participated in the study, there were some who stated that it should be done according to "both the *physician*'s order and the right to administer medication." Sample participant statements are given below.

N2: *"We should administer to the patient as required according to the order given by the physician. The right medicine, the right patient, the right dose."*

N9: *"After the examination of the patient, the physician gives the order, the drug is brought from the pharmacy, the drug is administered to the patient in a controlled manner and then the effects are observed. Right dose, right time, right patient, right route, right effect, right record."*

N12: *"Medicines should be used within the time recommended by the doctor. Medicines should not be interrupted, increased, or decreased without consulting a doctor. They should be used without skipping doses. Right answer, right medicine, right dose, right patient, right way."*

Theme 2: Correct answer tracking approach

After medication administration, nurses assess the patient (e.g., pain level) to monitor whether the medication has had the intended effect and whether any adverse effects have occurred. When nurses were asked about monitoring the correct medication effects, they focused only on vital signs and negative responses. In the interviews conducted on monitoring drug effects, participant nurses stated that they monitored vital signs (N1, N5, N7, N8, N12) and negative responses (N4, N6, N9). Examples of nurses' statements about monitoring vital signs are given below.

Subtheme 1: Monitoring only vital signs

Nurses mentioned that they mainly monitored only vital signs after drug administration. They emphasized that vital signs are important in terms of symptoms in the body. They also stated that they also monitored blood glucose levels.

N1: *"I consult a specialist. I follow vital signs and monitor blood glucose.. I pay attention to skin reactions. I keep the patients under observation for a while against complications and side effects of the drug."*

N5: *"...Attention should be paid to vital signs such as respiration..."*

N7: *"...I check values such as blood pressure and fever with care."*

N8: *"...I constantly check values such as blood pressure and fever."*

Table 1. Characteristics of the nurses interviewed

	Age	Gender	Education status	Working year	Working clinic	Weekly working hours	Number of patients given daily care
N1	38	Female	License	25	Internal medicine	45	14
N2	37	Female	License	12	Internal medicine	45	12
N3	45	Female	License	19	Surgery	40	8
N4	35	Female	License	12	Internal medicine	45	12
N5	48	Female	License	13	Internal medicine	40	9
N6	33	Male	Postgraduate	11	Intensive care	40	16
N7	31	Male	Postgraduate	9	Surgery	40	15
N8	32	Female	Postgraduate	10	Internal medicine	45	15
N9	28	Female	License	7	Intensive care	40	10
N10	32	Male	License	8	Surgery	45	25
N11	32	Male	License	9	Surgery	50	12
N12	29	Female	License	7	Intensive care	50	10

*N: Nickname

Table 2. Distribution of nurses' descriptive characteristics and drug administration behaviors (n=192)

Characteristics	**(Mean±SD)**
Age	30.46±6.96
Working year	7.1±6.31
Weekly working hours	44.92±5.71
Number of patients given daily care	15.42±11.89
Checking the drug package insert before administering medication	**n (%)**
Yes	104 (54.2)
No	10 (5.2)
Sometimes	78 (40.6)
Obtaining drug and food allergy history before the application	
Always; I think it is a vital situation.	143 (74.5)
I only question drug allergies.	44 (22.9)
No; I think the doctor is questioning.	4 (2.1)
No; the patient would have told me if he was allergic.	1 (0.5)
Reporting unexpected side/toxic effects	
Yes	188 (97.9)
No	4 (2.1)

N12: *"...I monitor vital signs and measure blood glucose."*

Examples of statements that nurses monitored drug effects only in terms of negative responses are given below.

N4: *"I go to the patient periodically to check the patient's condition and check whether there are conditions such as blood pressure oxygenation, redness, and swelling."*

N6: *"I stay in contact with the patient and check blood pressure and temperature."*

N9: *"...Allergic reaction and pulse blood pressure spo2 Vascular access, reactions that may occur in the body (swelling, redness, etc.)."*

Theme 3: Follow-up status of nurses after drug administration

Nurses talked about their implementation of the right response principle. The majority of the nurses shared their views on why they did not or could not follow the right response principle. They especially emphasized the low number of nurses per patient, high workload, and lack of time. In addition, they also mentioned that in case the nurses could not follow the right response principle, they put this responsibility on the patient.

Subtheme 3.1: Insufficient number of nurses

The nurses mentioned that they had difficulty in complying with the "rights" in drug administration, especially in following the right response principle. They stated that the main reason for this was the sparse

number of nurses per patient and the fact that all patients were cared for by a single nurse in the inpatient ward during night shifts. They also mentioned that nurses do not have time to realize the right response, especially due to the insufficient number of nurses.

N3: *"I think I did my best in accordance with the rights, but the number of patients per nurse is too high. In this case, it is not possible for me to follow up with each patient after administering medication. Sometimes we only intervene when a complication develops in the patient after administering the medication. Unfortunately..."*

N11: *"I am aware that adverse effects that may develop after administering medication are a great risk for both patients and nurses. However, the clinic where I work is very busy and I have to care for many patients. Which patient can I follow in this situation? Sometimes I just check my patient by asking "Are you okay?" but I don't have time to follow up because I have too many patients waiting. "*

Subtheme 3.2: Ineffective time management due to workload

Nurses mentioned that the workload of nurses is high due to the sparse number of nurses. It was observed that all nurses interviewed agreed on this issue. The nurses mentioned that they have many workloads in the clinic, such as the high number of patients, not only patient care but also documentation procedures, patient records, ensuring the general order of the clinic, cleaning the materials, and not having enough time for medication follow-up. Sample statements are given below (N7, N9).

N7: *"The right response principle needs to be controlled and monitored by all nurses. But I do not only provide patient care in the clinic, I also have many other duties. Since we have very few nurses, the workload of the existing nurses is very high. So when we work in the clinic, our priority is actually to catch up. Therefore, I do not have enough time to monitor the effect of drug administration."*

N9: *"There is an urgent need to regulate the number of patients per person and the number of nurses. I think that many of my colleagues do not have the opportunity due to their busy work schedules. Working conditions must be improved for both the profession and the patient. However, I have so many patients and work to do that I do not have time to evaluate the effects of medication."*

Subtheme 3.3: The burden of monitoring drug effects on the patient and/or patient's relatives

The nurses mentioned that they mostly monitor vital signs for the right response. However, they also stated that they asked both the patient and the patient's relatives to follow the effects of drug applications. Throughout the qualitative interview, the nurses generally mentioned about their heavy workload, not having enough time which prevent them regularly following up with the patients directly. For this reason, it appears that the nurses delegate the responsibility for medication administration follow-up to the patients and/or their relatives.

N1: *"I check whether there is any bad situation by observing and asking questions, and I check values such as blood pressure and fever by paying attention to them. I tell the patient that when he/she feels bad, he/she or his/her relatives should inform us."*

N5: *"I tell patients and their relatives about allergy symptoms and drug complications and ask them to inform me when these symptoms are seen in the patient."*

DISCUSSION AND CONCLUSION

Five rights of medication management have been developed to guide nurses to administer medicines safely and correctly. These are the right patient, right drug, right dose, right route, and right time. However, over time, errors in medication administration have increased. The correct rights in medicines management have been reviewed, and while the basic rights have remained constant, different information on new rights has been put forward. Other proposed rights include the right to refuse, right information, right questions, right challenges, right reason, right advice, right education, right preparation, right assessment data, right documentation, right frequency, right date, right drug approach, right drug-drug interaction, right assessment, and finally, the right response or outcome (4,18).

In the literature, there are studies on five correct rights in the drug method (8,19,20). However, the number of studies including the right to correct response/evaluation, which is among the rights, is relatively low (19,21).

The Joint Commission (2021), an accreditation body in health services, provides implementation standards for the improvement of health organizations. The organization's 2021 patient safety goals for hospitals include the importance of medication management in terms of patient safety practices. These goals comprise recommendations for medication practices, including right-to-know recommendations. Unfortunately, non-compliance with institutional or manufacturer policies and acts of negligence remain a common cause of medication administration errors (22). In addition, important medication administration rights, including right route, right patient, right time procedures, patient-directed preparation of drug doses and monitoring of reactions to the drug, i.e., the correct response steps, are not consistently followed. These situations cause medication administration errors and put both patients and nurses at risk (23,24).

Positive and negative effects of the drug should be monitored in patients depending on drug applications. Improvements in the disease process should be monitored depending on drug applications. However, in some cases, patients may develop unwanted side effects due to drug administration (25). Since nurses administer most medications in health care settings, they have a unique position in the health care team to monitor the patient's response to medication. For this reason, nurses need to monitor their patients to follow the positive and negative effects, to take precautions against adverse effects that may develop, and to apply interventions. They should usually be present when an adverse effect occurs and be involved in taking appropriate measures to improve the problem accordingly (26,27).

In one study, nurses were observed during drug administration over a period of twelve months. According to the results of the study, it was reported that 57.7% of the nurses made at least one error during medication administration and the second most common error was the correct response (27.5%) (28). Castaneda et al. conducted a study on the use of simulation to improve the medication management competence of nursing students. According to the results of their study, it was stated that 54.2% of the students did not perform the correct response step, while the students mostly did the right patient, right dose, right way, right time rights correctly (29). In a study by Mohammed et al. (2022), it was reported that 6.2% of the nurses followed the correct response right incorrectly. In another observational study, it was determined that 88.0% of the nurses practiced the right to the correct answer (30). In our study, it was found that 97.9% of the nurses reported unexpected side/toxic effects and 58.3% attended the patient at certain intervals to check. After the qualitative interviews with the nurses, most of the nurses stated that the right to administer medication should be done according to the physician's order. Very few of the nurses were able to count correct drug administration as five rights. In this case, we can say that nurses lack knowledge about the right to administer medication. At the same time, the fact that the nurses stated that they administered according to the physician's order, suggests that they were not sufficiently informed about their duties, roles and responsibilities. In addition, it is also seen that the correct response follow-up of nurses is not high. Therefore, nurses should first be informed to remind them of their duties, authorities and responsibilities, followed by training on the correct rights for drug administration. When we compare the results of our study with the studies in the literature, it is seen that there are different results regarding the right to correct response. It may be recommended to investigate the reasons for this difference, to review the policies implemented in studies with high right to correct response and to compare them with study regions with low results.

There are multiple reasons for medication administration errors (31). In studies conducted in the literature, some of these reasons are stated as follows: professional factors (such as lack of experience, education, lack of communication skills), organizational factors (high number of patients, insufficient number of nurses, high workload of nurses), work-related factors (such as workload, relationships with other colleagues) and personal factors (such as nurses' health status, fatigue, lack of initiative in resolving drug-related doubts). The high workload of nurses and lack of training in drug administration in particular are stated as the main reasons (30,32). It has been stated in some studies that insufficient time and distractions are the most common factors in errors made in drug administration (24,33). Similarly, in our study, nurses mentioned that they and their colleagues did not have time to realize the right of correct response due to the

sparse and insufficient number of nurses per patient. In addition, all the nurses stated that their workload was too high with the shortage of nurses. At the same time, they revealed that they not only provide patient care in clinical practice but also have many additional duties. As a result of the combination of all these reasons, the nurses stated that they did not have sufficient time for correct response monitoring. According to these results, it is recommended to determine the ideal ratio of the number of nurses per patient and to increase the number of nurses to ensure accurate drug response monitoring (34). At the same time, we can also suggest that the workload of nurses should be regulated by discussing with hospital administrators the factors that make it difficult to follow up the correct response.

While nurses participate in training and skill competency assessments related to safe medication administration, difficulties encountered in a busy working environment can affect their behavior (33). They need support in situations such as insufficient number of nurses and lack of time. Allocating the necessary time to complete each step of the five rights and identifying practice situations that contribute to interruptions or distractions, can reduce errors and prevent adverse effects (35)

One of the striking points in the qualitative interviews was that some nurses stated that they asked both the patient and the patient's relatives, to monitor the effect of drug administration. They stated the reason for this as excessive workload and lack of time. No study on this issue was found in the literature, however, the right response is the responsibility of the nurse. Therefore, it may be recommended to make necessary arrangements by considering the reasons for nurses not practicing the right to a correct answer.

The limitations of the study include the fact that it was conducted in a single center and in the departments (internal medicine, intensive care, and surgery) of health institutions, where most drug administration is performed.

According to the results of our study, while the majority of nurses stated that they reported unexpected/adverse effects, on average, half of the nurses stated that they checked the patients at certain intervals. At the same time, the nurses stated that they could not apply the right to correct response due to a lack of knowledge about the right medication, practicing according to the physician's order, high workload, sparse number of nurses, and lack of time. As a result, some of the nurses stated that they gave the responsibility of correct response follow-up to the patient or the patient's relatives. According to the results of our study, it is recommended that the reasons for not implementing the right response should be evaluated, and the number of nurses should be increased, workload should be regulated, and training should be organized for nurses regarding the right to administer correct medication and in particular, regarding the importance of correct response. It is also recommended that nurses receive training and counselling on their duties, authorities and responsibilities.

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Conflict-of-interest and financial disclosure

The authors declare that they have no conflict of interest to disclose. The authors also declare that they did not receive any financial support for the study.

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