

ORIGINAL ARTICLE

Evaluation of Knowledge, Attitude and Behavior of Pharmacy Staff About Rational Drug Use

Eczane Personelinin Akılcı İlaç Kullanımı Konusunda Bilgi, Tutum ve Davranışlarının Değerlendirilmesi

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ABSTRACT

Introduction: Irrational drug use is a severe problem affecting public health, increasing morbidity, mortality rates, and treatment costs. Healthcare personnel has important responsibilities in this regard. In this study, we aimed to evaluate the knowledge, attitudes, and behaviors of pharmacists, assistant pharmacists, and pharmacy technicians.

Materials and Methods: Pharmacists, assistant pharmacists, and technicians working in pharmacies registered in an urban area were reached. Volunteers with the support extended to literature Turkey Pharmaceuticals and Medical Devices Agency, Department of Rational Drug Use 'Survey of Hospital Pharmacists were required to be filled out online.

Results: 156 pharmacy personnel voluntarily participated in the study. Of the volunteers, 48.1% were pharmacists, 4.5% pharmacy assistants, and 47.4% pharmacy technicians. 59% of the participants declared that they did not receive training on rational drug use. Among pharmacy technicians, this rate is 73%. All pharmacies monitor the drug monitoring with electronic devices or instant measurements by the responsible persons; 99.4% of the participants stated that they informed the patient about the storage conditions of the drug, and 84% informed the health personnel about the drug with a special preparation condition. 18.6% of the participants reported one or more adverse events in the last two years. It has been determined that there is no complete standardization in the disposal of residual/waste drugs for drugs from patients.

Conclusion: In order to organize rational drug use training for pharmacy technicians, implement a standard method for waste residual medicine management, and increase feedback on pharmacovigilance practices, it is necessary to encourage the staff.

Keywords: Rational drug use, Pharmacist, Pharmacy staff, Pharmacy technician

Öz

Giriş: Akılcı olmayan ilaç kullanımı, morbidite, mortalite oranları ve tedavi maliyetlerinde artışa neden olması açısından halk sağlığını etkileyen ciddi bir sorundur. Sağlık personellerine bu konuda önemli görevler düşmektedir. Bu çalışmada eczacı ve sahada hasta ile aktif olarak teması olan yardımcı eczacı ve eczane teknikerlerinin akılcı ilaç kullanımı ilkelerine dair bilgi tutum ve davranışlarını değerlendirmeyi amaçlanmıştır.

Gereç ve Yöntem: Bir kentsel bölgeye kayıtlı eczanelerde çalışan eczacı, eczane yardımcısı ve teknikerlerine ulaşarak, gönüllülerden literatür desteği ile genişletilmiş Türkiye İlaç ve Tıbbi Cihaz Kurumu Akılcı İlaç Kullanımı Dairesinin 'Hastane Eczacı Anketi'ni online olarak doldurmaları istenmiştir.

Bulgular: Çalışmaya 156 eczane personeli gönüllü olarak katılmıştır. Gönüllülerin %48,1'i eczacı, %4,5'i eczane yardımcısı %47,4'ü eczane teknikerlerinden oluşmuştur. Katılımcıların %59'u akılcı ilaç kullanımı eğitimi almadıklarını beyan etmişlerdir. Eczane teknikerleri arasında bu oran %73'tür. Eczanelerin tamamı ilaç takibini, elektronik cihazlar veya sorumlu kişilerce anlık ölçümlerle izlemekte, katılımcıların %99,4'ü ilaçla ilgili saklama koşulları ile hastayı, %84'ü özel hazırlama koşulu olan ilaç için sağlık personelinin bilgilendirdiğini belirtmişlerdir. Katılımcıların %18,6'sı, son 2 yıl içinde bir veya daha fazla advers etki bildirimde bulunmuşlardır. Hastalardan gelen ilaçlara yönelik atık/atık ilaçların bertarafında tam bir standardizasyon olmadığı belirlenmiştir.

Sonuç: Eczane teknikerlerine yönelik akılcı ilaç kullanım eğitiminin düzenlenmesi, atık/atık ilaç yönetimi ile ilgili standart bir yöntemin uygulamaya geçirilmesi ve farmakovijilans uygulamaları ile ilgili geribildirim artırılması amacıyla eczane personellerinin teşvik edilmesi gerekmektedir.

Anahtar Kelimeler: Akılcı ilaç kullanımı, Eczacı, Eczane personeli, Eczane teknikeri

Introduction

At its first meeting in Nairobi in 1987, the World Health Organization (WHO) defined Rational Drug use (RDU) as "Complying with the rules for taking the most appropriate drug, at the appropriate time and dose, at an affordable cost, according to the clinical findings and individual characteristics of the people"(1). Today, RDU is defined as a set of principles covering many areas, from the production of the drug to the pharmacy shelves, the physician's prescription to the patient's use of the drug, and the disposal of the drug in accordance with the rule (2). Although progress has

been made regarding RDU since it was discussed, one in every two drugs is still prescribed, distributed, or sold inappropriately worldwide. On the other hand, half of the patients do not use the drugs correctly (1). Irrational drug use causes failure to provide effective treatment to the patient. As a result of the irrational drug use problem, there are situations such as repeated hospital admissions, the need for multiple drug use, drug-drug interactions, an increase in the frequency of drug side effects, deterioration of patient compliance, the burden of drug waste on the country's economy, and

environmental pollution caused by waste / residual drugs. Apart from increasing morbidity, mortality rates, and treatment cost burdens, another critical issue is drug resistance. Every year 700.000 people die worldwide from infection with drug-resistant bacteria. Irrational drug use is a serious public health problem (2, 3).

Physicians, pharmacists, other healthcare professionals, the pharmaceutical industry, professional organizations, non-governmental organizations, media, and the public are stakeholders of the RDU responsibility. All healthcare professionals have an important role in increasing the individual's health and quality of life by providing RDU (6).

Although the concept of rational medicine has been researched in many different groups in the literature, there are very few publications on pharmacy personnel. This study aimed to evaluate the knowledge, attitudes, and behaviors of pharmacists, assistant pharmacists, and pharmacy technicians who are in active contact with the patient in the field about the principles of rational drug use.

Material and Method

The research is a descriptive cross-sectional study. Pharmacists, assistant pharmacists, and technicians working in pharmacies registered in an urban area were reached. Volunteers were asked to answer a questionnaire consisting of 32 questions. The questionnaire includes 21 questions from the 'Hospital Pharmacists Questionnaire' belonging to the Rational Drug Use Department of the Turkish Medicines and Medical Devices Agency. One question in this questionnaire has been changed for pharmacy technicians. The question "Would you recommend drugs to your clients?"; was replaced by the question "If you are a pharmacy staff, would you refer your customer to your pharmacist?". The content of the questionnaire consists of questions evaluating the sociodemographic data of pharmacy personnel, awareness, behavior, and attitudes about rational drug use. In addition, drug knowledge level, adverse drug reporting rates, waste drug approaches, and drug counseling were also examined.

The data obtained from this device were analyzed using the SPSS 20 (Statistical Package for Social Sciences, USA) program. In statistical analysis, categorical variables were expressed as numbers and percentages. An information score including nine (9) sub-headings was created to evaluate the level of knowledge about the drug's indications, posology, pharmacological properties, contraindications, side effects, drug interactions, drug warnings, and special conditions such as pregnancy and bioequivalence. It was evaluated as very good 1 point, good 2 points, average 3, bad 4, and very bad 5 points. Kruskal-Wallis H test was used for mean comparisons between groups, and the relationship between categorical variables was evaluated by Chi-Square analysis. 0.05

was used as the significance level. It was stated that there is a significant difference if $p < 0.05$, and there is no significant difference if $p > 0.05$. The study obtained approval from the Afyonkarahisar Health Sciences University Clinical Research Ethics Committee (No: 2020/283).

Results

156 pharmacy personnel voluntarily participated in the questionnaire filled out via Google Forms. 69.2% of the participants were male, and 30.8% were female. 48.1% of the volunteers are pharmacists, 4.5% are pharmacy assistants, and 47.4% are pharmacy technicians. While 17.3% of pharmacists have graduate and doctorate degrees, 59.9% of pharmacy technicians are high school graduates. 82.2% of the participants are between the ages of 18-50. (Table 1)

According to the answers evaluating the pharmacy conditions, 53.8% of the participants are pharmacy personnel in the city center. The number of staff working in the pharmacy is between 1 and 7. 57.7% of community pharmacies are closer than 100 meters to a health institution.

43.6% of the volunteers stated that they attended vocational training. No relationship was found between pharmacy duties and in-service training participation ($p > 0.05$). However, the difference between the groups is insignificant; as the education level increases, the number of those receiving RDU education increases.

59% of pharmacy staff stated they did not receive rational drug use training. This rate is 73% among pharmacy technicians. 90.7% of pharmacists recommend medication to consultants. 77% of pharmacy technicians refer their patients to their pharmacists to specifically recommend vitamins, supplements, and over-the-counter medicines.

All pharmacies monitor the medication follow-up with instant measurements by electronic devices or responsible persons. 99.4% of the participants stated that they informed the patient who applied for the storage conditions related to the drug, and 84% of the healthcare personnel for the drug with a special preparation condition. No significant difference was found among pharmacy staff in providing drug information to patients. The group that communicates with the physician due to prescription or patient consists of pharmacy technicians ($p < 0.008$).

18.6% of pharmacy staff have reported one or more adverse reactions in the last 2 years. 84.4% of them stated that they did not make any notification. 35.3% of the 34 notifying personnel stated that they made more than 10 pharmacovigilance notifications yearly. Pharmacies in the city center report more ($p < 0.027$). 82% of the pharmacy personnel do not keep a record regarding the non-prescription drug recommended.

Table 1. Answers to the Questionnaire by Occupational Distribution

		Pharmacist		Pharmacist assistants		Pharmacist technicians		Total	
		%	f	%	f	%	f	%	f
Age	18-30	14	18.7%	5	71.4%	30	40.5%	49	31.4%
	31-40	28	37.3%	2	28.6%	28	37.8%	58	37.2%
	41-50	14	18.7%	0	0.0%	15	20.3%	29	18.6%
	51-64	16	21.3%	0	0.0%	1	1.4%	17	10.9%
	65 years and older	3	4.0%	0	0.0%	0	0.0%	3	1.9%
Gender	Woman	26	34.7%	4	57.1%	18	24.3%	48	30.8%
	Men	49	65.3%	3	42.9%	56	75.7%	108	69.2%
Education Status	Primary Edu.	0	0.0%	0	0.0%	8	10.8%	8	5.1%
	High School	0	0.0%	0	0.0%	44	59.5%	44	28.2%
	Associate Degr.	0	0.0%	0	0.0%	14	18.9%	14	9.0%
	License	62	82.7%	7	100.0%	5	6.8%	74	47.4%
	Master Degree	12	16.0%	0	0.0%	3	4.1%	15	9.6%
	Doctoral Degree.	1	1.3%	0	0.0%	0	0.0%	1	0.6%
Work Experience	1-3	5	6.7%	5	71.4%	11	14.9%	21	13.5%
	4-10	17	22.7%	2	28.6%	11	14.9%	30	19.2%
	11-15	15	20.0%	0	0.0%	15	20.3%	30	19.2%
	16-19	12	16.0%	0	0.0%	14	18.9%	26	16.7%
	20 years and older	26	34.7%	0	0.0%	23	31.1%	49	31.4%
Do you attend vocational training?	Yes	35	46.7%	2	28.6%	31	41.9%	68	43.6%
	No. I do not have time	25	33.3%	1	14.3%	21	28.4%	47	30.1%
	No. there is no on-the-job training in my region	6	8.0%	4	57.1%	20	27.0%	30	19.2%
	No: I don't think I need an education	2	2.7%	0	0.0%	2	2.7%	4	2.6%
	No: Topics of the training	7	9.3%	0	0.0%	0	0.0%	7	4.5%
	I am not interested								
Have you received training on rational drug use?	Yes	38	51.4%	5	71.4%	20	27.0%	63	40.6%
	No	36	48.6%	2	28.6%	54	73.0%	92	59.4%
Do you recommend medication to clients / if you are a pharmacy staff? Would you refer to your pharmacist?	Yes	68	90.7%	5	71.4%	57	77.0%	130	83.3%
	No	7	9.3%	2	28.6%	17	23.0%	26	16.7%
Do you report adverse drug reactions?	Yes	17	22.7%	4	57.1%	19	25.7%	40	25.6%
	No	58	77.3%	3	42.9%	55	74.3%	116	74.4%

Table 2: Rational Drug Use Training and Professional Relationship

		Rational Drug Use Training		p*
		Yes	No	
Pharmacist	n	39	36	0,001
	%	52,00%	48,00%	
Pharmacist assistants	n	5	2	
	%	71,40%	28,60%	
Pharmacist technicians	n	20	54	
	%	27,00%	73,00%	
Total	n	64	92	
	%	41,00%	59,00%	

*Fisher's Exact Test , p= p value; n= number

Table 3: Relation between Mission in a Pharmacy and Information Score

	Mission in a Pharmacy	n	Mean Score	Chi-Square	*p
Information Score	Pharmacist	75	67,94	12,704	0,002
	Pharmacist assistants	7	123,86		
	Pharmacist technicians	74	84,91		
	Total	156			

*Kruskal Wallis Test p= p value; n= number

Different approaches regarding residual / waste drugs received from patients, such as not accepting the drug (48.1%), leaving it to a health institution (26.1%), or delivering it to people in need (14.7%), were stated. 53.8% asked whether the patient used a herbal product while giving the drug to the patient. Almost half of the pharmacy personnel (49.4%) stated that the most common mistake made in society was using drugs in the wrong way, with the wrong dose, and at the wrong time. The most preferred method (78.2%) to increase treatment compliance was chosen as "informing patients about the correct use of drugs". The vast majority of those who receive rational drug use training are significantly "assistant pharmacists" (Table 2). A significant difference between those who received rational drug use training and those who did not, between age, gender, professional experience, indication, contraindication, pharmacological characteristics, posology, drug-drug interaction, side effects, special conditions, drug knowledge level such as bioequivalence, approach to waste drug and pharmacovigilance could not be determined ($p > 0.05$). Only in the group with long working hours in a community pharmacy, the number of those who received rational drug training was significantly less ($p < 0.05$).

73.7% of the participants use RxMediaFarma as a source of information about the drug. An evaluation score was formed among the questions the volunteers were asked to answer with the self-assessment method, which consists of nine (9) questions. It was determined that there were significant differences in answers among pharmacy personnel; the score was high among pharmacists, followed by pharmacy technicians and auxiliary pharmacists (Table 3).

Discussion

The pharmacist is the person who contacts the patient in the last step of the treatment. This is important because the pharmacist is the last health professional with whom the patient will contact. Within the scope of the RDU, it is among the pharmacist's duties to supply the drug under appropriate conditions, control the incoming prescription, provide the patient record, inform the patient about the drug correctly, provide the proper counseling about the drug, and cooperate with the physician when necessary and report adverse effects related to drug use to the authorities (7-8). However, research on RDU has been examined by many groups such as physicians, nurses, elderly patients, and students. Research with different groups underlines the same thing. It is crucial and necessary to ensure the adoption and dissemination of rational drug use behavior (9-12). For all that, not many publications in the literature include pharmacy technicians and question the principles of RDU. For this reason, the research is original and valuable.

Pharmacist technicians take part in the procurement, registration, storage, and presentation of prescription or non-prescription products in the pharmacy under

the supervision, responsibility, and supervision of pharmacists (13). Another group defined as pharmacy staff is assistant pharmacists. With the amendment to the law numbered 6197, the pharmacists who were qualified to study in the faculty of pharmacy in 2013 and who have recently graduated are required to work as an assistant pharmacist for one year for the right to open a free pharmacy (14). According to the data obtained through self-assessment, the level of drug knowledge is lower in newly graduated assistant pharmacists than of the pharmacy technicians. The opposite is expected for a pharmacist candidate who has just completed his university education. The reasons for this may be the subject of another study. It can be attributed to the fact that the participants of this research are mostly pharmacy personnel who have professional experience and have been working in community pharmacies for a long time.

Approximately two-thirds of the pharmacy personnel participating in our study stated that they did not receive RDU training. RDU is currently included in the Undergraduate Pharmacy Education, National Pharmacy Core Education Program. In this program, RDU is one of the objectives of undergraduate education (15). Education should continue after graduation because continuity of education within the context of rational medicine is essential (16). Almost half of the participants attend in-service training. In our study, it is observed that the higher the education level, the higher the rate of participation in in-service training. The rate of those who say that there is no in-service training in their region is 19.2%. The rate of pharmacy technicians who do not receive RDU training is relatively high. In this respect, the provision of RDU training and providing them at an accessible level should be planned by the local authorities. In the study conducted by Demirci et al. with 182 pharmacy employees in Aydın in 2019, it was determined that while the in-service training participation rate was 38.5%, the rate of pharmacists who received rational drug training was 65% (17). The pharmacist who received RDU training in this study is 51.4%. The rate of participation in in-service training is slightly higher with 43.6%.

In this research, over-the-counter products called OTC are highly recommended to the applicants. According to studies, OTC products are an important cause of adverse drug reactions, especially for the elderly. Nearly 65% of medication errors can be prevented with the intervention of a clinical pharmacist (18). The role of pharmacists in choosing OTC group drugs appropriately and informing the patient correctly should not be overlooked (19-20).

The vast majority of pharmacy personnel participating in our study choose to inform the patient in order to increase treatment compliance. The information to be given for prescription and non-prescription products or drugs should be presented basing on good communication with the patient. It should be of a quality to contain necessary and sufficient information.

Accurate information is one of the most critical factors that increases treatment compliance. It is also an important point within the scope of RDU (21-22).

Healthcare professionals are responsible for reporting adverse drug reactions (ADR) thought to be drug-related to Turkey Pharmacovigilance Center within fifteen days, directly or through the pharmacovigilance contact point. Pharmacovigilance is an important task of the pharmacist (23-24). According to estimates, ADR ranks 4th or 5th among hospital admissions, and the vast majority require inpatient treatment. ADR brings an economic burden to health. Studies show that adverse drug reactions are mainly preventable. For example, questioning the patient's allergy before giving penicillin to a patient will protect the patient from possible drug effects. Therefore, applying the principles of RDU reduces the risk of ADR (25). Pharmacovigilance data are of great importance in terms of 'Drug Safety. Spontaneous reporting of pharmacovigilance among health professionals is low, and awareness needs to be raised (26-27). In another study conducted with pharmacists in Turkey, ADR notification rates were between 5-9% (28). In this study, it is 18.6%, and 35% of them make more than 10 notifications per year. Considering these rates, it is possible to say that many opportunities are missed in terms of drug side effects reporting.

All pharmacists, pharmacy assistants, and pharmacy technicians who participated in our study stated that they do not recommend antibiotics. Misuse and unnecessary use of antibiotics should be prevented against the problem of multi-drug resistance (29). The study examining the effect of RDU 's 2014-2017 national action plan on antibiotic prescriptions showed that the rate of prescribing antibiotics decreased with awareness studies. Within the scope of the action, the implementation of e-prescriptions, the introduction of prescription tracking systems, the cessation of non-prescription antibiotic sales, and the effect of RDU training are very important. From this point of view, the continuity of the pieces of training are valuable (30).

Herbal products and herbal medicine usage is increasing worldwide. As well as drug-drug interactions, drug-plant interactions can reach life-threatening levels (31). Most patients may not share the herbal product they use. For this reason, it should be questioned whether the patients use a herbal product or not while preparing their prescriptions (32). It is the pharmacist's responsibility to inform the patient about possible side effects. According to this study, only 1 out of 2 pharmacists ask this question to patients. It is the pharmacist's responsibility to inform the patient about possible side effects. This issue should be supported by in-service training.

RxMediaPharma® is a database presented as a drug information resource. It serves on a subscription basis. Provides physicians, pharmacists, and other healthcare professionals with information on current drug information and new developments (33).

Medicines are chemical substances that must be stored under appropriate temperatures and conditions. Some medicines and vaccines should be transferred in the cold chain and not be affected by possible technical problems. All of the pharmacies use a technological infrastructure in terms of supplying the drug, storing it under appropriate conditions, and tracking stock. They determine the relevant responsible people and ensure their follow-up.

It has been determined that almost one half of the pharmacies do not accept waste drugs, the other half resort to various methods, such as leaving them to Family Health Centers, giving them to the needy, sending them to the municipal pharmacy, leaving them to the service of the state hospital. It has been determined that there is no complete standardization in residual/ waste medicine management. The rate of those who dispose of waste medicine in accordance with the regulations is 5.8%. The contamination of waste drugs in the environment threatens public health. In a study, it was stated that the delivery of drugs to the pharmacy is the least harmful way to the environment. (34-35).

The limitation of this study is that the surveys are conducted online under Covid-19 conditions. We think studies conducted in a larger population may reveal the differences in rational drug education more clearly.

Conclusion

Pharmacy personnel should be encouraged to organize rational drug use training for pharmacy technicians, implement a standard method for waste / residual drug management, and increase feedback on pharmacovigilance practices.

Informed Consent: From the participant himself/herself

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