

# Evaluation of the knowledge and opinions of university students in rational drug use

## Akılcı ilaç kullanımında üniversite öğrencilerinin bilgi ve görüşlerinin değerlendirilmesi

Murat Doğan<sup>1</sup>, Bülent Saraç<sup>2</sup>

<sup>1</sup>Department of Pharmaceutical Biotechnology, Faculty of Pharmacy, Sivas Cumhuriyet University, Sivas, Turkey

<sup>2</sup>Department of Internal Medicine Science, Pharmacology, Faculty of Medicine, Sivas Cumhuriyet University, Sivas, Turkey


**Corresponding author:** Murat Doğan, PhD, Department of Pharmaceutical Biotechnology, Faculty of Pharmacy, Sivas Cumhuriyet University, Sivas, Turkey


**E-mail:** mdogan@cumhuriyet.edu.tr

**Received/Accepted:** February 20, 2020 /May 11, 2020

**Conflict of interest:** There is not a conflict of interest.

### SUMMARY

 Murat Doğan

 Bülent Saraç

**Objective:** The aim of this study is to evaluate the knowledge and opinions of students at Sivas Cumhuriyet University on rational drug use.

**Method:** In this study, 400 students at different faculties at Sivas Cumhuriyet University constituted the universe of this study. All students who agreed to participate in the study were included. A questionnaire consisting of 17 questions about rational drug use was prepared and students were allowed to participate in the survey with their own consent.

**Results:** In our study, the responses of the participants to the questions in the questionnaire study were evaluated. According to the results, it was observed that the participants do not have sufficient information about rational drug utilization. It was observed 230 women participants and 170 men participants included in our study.

**Conclusions:** As a result of the survey, the opinions of the participants were evaluated. According to the results obtained, the majority of the participants should be informed about rational drug use.

**Keywords:** Rational drug use, physician, pharmacist.

ORCID IDs of the authors:  
M.D. 0000-0003-2794-0177  
B.S. 0000-0002-0799-0647

### ÖZET

**Amaç:** Bu çalışmanın amacını Sivas Cumhuriyet Üniversitesindeki öğrencilerin akılcı ilaç kullanımına yönelik bilgi ve görüşlerinin değerlendirilmesi oluşturmaktadır.

**Yöntem:** Bu çalışmada, Sivas Cumhuriyet Üniversitesinde farklı fakültelerde bulunan 400 öğrenci çalışmanın evrenini oluşturdu. Çalışmaya katılmayı kabul eden tüm öğrenciler dâhil edildi. Akılcı ilaç kullanımı ile ilgili 17 sorudan oluşan anket hazırlandı ve öğrencilerin kendi rızaları ile ankete katılmaları sağlandı.

**Bulgular:** Yapmış olduğumuz çalışmada, katılımcıların anket çalışmasında bulunan sorulara verdikleri yanıtlar değerlendirilmiştir. Sonuçlara göre katılımcıların akılcı ilaç kullanımı hususunda yeterli bilgiye sahip olmadığı gözlenmiştir. Çalışmamızda, 230 kadın ve 170 erkek katılımcının dâhil olduğu gözlenmiştir.

**Sonuç:** Anket sonucunda katılımcıların fikirleri değerlendirilmiştir. Elde edilen sonuçlara göre katılımcıların çoğunluğuna akılcı ilaç kullanımı ile ilgili gerekli bilgilendirme yapılmalıdır.

**Anahtar sözcükler:** Akılcı ilaç kullanımı, hekim, eczacı.

## INTRODUCTION

The drug is defined as a combination of active ingredients or substances of natural or synthetic origin which administered to diagnose, treat, prevent the disease, and regulate or alter a physiological function. In addition to these crucial properties of medicines, there are issues that we need to pay attention to in drug use. For this purpose, rational drug use has come to the agenda of society. The World Health Organization (WHO) has defined rational drugs as depending on the clinical findings and individual characteristics of individuals; it is the ability to provide a suitable drug at the appropriate time, dose, and easily at the lowest price<sup>1</sup>. The drug should be administered at the right time and dose, with the correct route of administration. Besides, the drug should be used taking into account the advice and information of the doctor and pharmacist. In rational drug use, the treatment process determined by the doctor should be continued. Otherwise, the treatment of the disease may not be beneficial. Health and expectations of society should be the primary target in rational drug use<sup>2,3</sup>. In the world, the use of wrong, unnecessary and high-cost drugs poses a health problem. These include prescribing and using inappropriate drugs for patients with chronic conditions, using drugs and antibiotics unnecessarily, and failure of the physician to provide adequate information to the patient<sup>2,3</sup>. The doctor should diagnose the patient by listening to the complaints of the patient and learning the important diseases that the patient has experienced. In addition, by defining the effective treatment with or without medication, if medication is to be administered, the procedures of prescription should be done in order, depending on the selection of the most appropriate drug for the treatment and the determination of the appropriate dose and the time period of administration. For this purpose, diagnostic and treatment guidelines in practice should be used. In addition, the drugs that the patient has used and are still using should be learned<sup>4,5</sup>. Patients or relatives of the patient should be informed about possible side effects of the drug, food–drug and drug–drug interactions. In particular, patients with kidney or liver failure, people having an allergic reaction to some medications, women during pregnancy and breastfeeding, children and elderly people should be provided to be careful by explaining in detail about the drug use. Medicines should be kept out of the reach of children. When taking medicines to the pharmacy, the expiration date and packaging of the drug should be checked, and it should be noted whether the instructions for use of the drug have

been written by the pharmacist or co-workers<sup>3,5</sup>. In order to perform rational drug use more effective and useful, it is necessary to evaluate how well physicians, pharmacists, patients, and their relatives meet the criteria related to rational drug use and to determine their knowledge and behavior. This study aimed to evaluate the knowledge and experiences of the students at Sivas Cumhuriyet University on rational drug use.

## MATERIAL AND METHODS

### Scope of the Research:

The foundation of this study has consisted of 400 students from different faculties at Sivas Cumhuriyet University. All students with agreed to participate in this study were included in the study.

### Application of the Research:

The survey was prepared via utilizing the form named “Knowledge towards rational drug use in Turkey and behavioral assessment study” belonging from the Republic of Turkey Ministry of Health Medicines and Medical Devices Agency Rational Drug Use Unit<sup>6,7</sup>. The purpose of the study was explained to the participants and the questionnaire, which was prepared by learning that the participants could assist with their own consent in these procedures, was applied face-to-face. Participants have received an informed consent form containing information about explaining the work to be performed, informing that the data will be kept confidential. The questionnaire was applied after the participant declared in writing or verbally that these procedures were allowed. The data of this study were collected between January 2020 and February 2020. Ethics committee approval (date: 15.01.2020, decision no: 2020-01/27) was obtained from the Sivas Cumhuriyet University Non-Interventional Clinical Research Ethics Committee. Descriptive statistics (number, percentage distribution, mean, standard deviation) were used to present the data.

### Statistical analysis:

In the study on rational drug use, the data obtained were evaluated with the SPSS 23.0 program. Frequency and percentage values and chi-square ( $\chi^2$ ) test and association measures were used to evaluate the data.  $p < 0.05$  was considered to be indicative of significance.

## RESULTS and DISCUSSION

### Demographic Findings

Frequency and percentage values of the variables of gender, the age which is determined as

**Table 1:** The number and rate of the participants depending on the age range.

Age range	The number of participants	The rate of participants
15-28	236	59.00 %
29-40	65	16.25 %
41-50	51	12.75 %
51-64	41	10.25 %
65 and over	10	2.50 %

**Table 2:** The number and rate of the participants depending on gender.

Gender	The number of participants	The rate of participants
Female	230	57.50 %
Male	170	42.50 %

demographic variables in the study. **Table 1** and **Table 2** showed the demographic results of the participants. These results indicated that the great majority of this survey consisted of women and 15-28 age range participants.

### Evaluation of the Data

The drug has importance in our life. Therefore, we need to have enough ideas and knowledge about medicines. Increased medicines after treatment should be properly maintained or delivered to relevant institutions<sup>8</sup>. The majority of 280 (70.0 %) participants stated that they keep the drugs that increased after the treatment for use when necessary. On the other hand, some 65 (16.3 %) participants stated that they throw the increased medicines into the trash. In fact, it can be more appropriate to give medicines to the health institution instead of being thrown away as the increased medicines may be needed the healthcare services. Data on the question of where are you storing medicines without any warning about storage conditions are shown in **Table 3**. According to the result, 298 (75.5 %) of the participants keep drugs at room temperature. In addition, 98 (24.5 %) of the participants store drugs in the refrigerator. The results are statistically significant ( $\chi^2=26.547$ ;  $p<0.05$ ).

**Table 3:** Results of the storage place of the drugs without storage condition are stated.

Age		The place where the drugs without storage conditions are indicated			Total
		Refrigerator	Deep freeze	in room temperature, cool and dry place	
15-28	Count	73	2	161	236
	% within age	30.9%	0.8%	68.2%	100.0%
29-40	Count	17	0	45	62
	% within age	27.4%	0.0%	72.6%	100.0%
41-50	Count	5	2	44	51
	% within age	9.8%	3.9%	86.3%	100.0%
51-64	Count	3	0	38	41
	% within age	7.3%	0.0%	92.7%	100.0%
65 and over	Count	0	0	10	10
	% within age	0.0%	0.0%	100.0%	100.0%
Total	Count	98	4	298	400
	% within age	24.5%	1.0%	74.5%	100.0%

Chi-Square Test			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	26.547	8	0.001
N of Valid Cases	400		

In our country, since millions of drugs have expired they are thrown away without using for the treatment. For this reason, necessary training should be provided to the society on the prevention of drug waste, conscious drug utilization. This is one of the subjects in which we took the opinion of the participants in our study. The results showed that 174 (43.5 %) of the participants discarded (1-4) boxes of the drug due to the expired. In addition,

121 (30.3 %) of the participants do not discard any drugs. Unfortunately, **Table 4** results showed the great majority of participants do not have enough consciousness about rational drug utilization. It can be concluded from the results participants between 15 and 28 age groups are more conscious than others. The results are statistically significant ( $\chi^2=132.848$ ;  $p<0.05$ ).

**Table 4:** The rate and number of participants who discarded medicine due to the expired date

Age		The medicine is discarded due to the expired date					Total
		1-4	5-7	8-10	over 10	Non thrown	
15-28	Count	122	22	13	3	76	236
	%	51.7%	9.3%	5.5%	1.3%	32.2%	100.0%
29-40	Count	28	7	3	6	18	62
	%	45.2%	11.3%	4.8%	9.7%	29.0%	100.0%
41-50	Count	14	3	1	22	11	51
	%	27.5%	5.9%	2.0%	43.1%	21.6%	100.0%
51-64	Count	7	6	9	3	16	41
	%	17.1%	14.6%	22.0%	7.3%	39.0%	100.0%
65 and over	Count	3	2	0	5	0	10
	%	30.0%	20.0%	0.0%	50.0%	0.0%	100.0%
Total	Count	174	40	26	39	121	400
	%	43.5%	10.0%	6.5%	9.8%	30.3%	100.0%

#### Chi-Square Test

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	132.848	16	0.001
N of Valid Cases	400		

The participants were asked about the points they paid attention to while using the drugs. As expected, it was observed in **Table 5** that, the vast majority 228 (57.0 %) of participants used the drugs according to the pharmacist's recommendations and the drug prospectus.

However, it was observed in some 18 (4.5 %) participants who use drugs only by relying on their knowledge without consulting the pharmacist. Participants with 51-64 age groups use the drug on their own knowledge at the rate of 11.2 %.

**Table 5:** The rate and number of participants with used drugs with or without the recommendation

Age		Evaluation of the use of drugs taken from the pharmacy					Total
		on pharmacist's recommendation	on prospectus	on their minds	on pharmacist's recommendation and prospectus	other	
15-28	Count	68	25	7	134	2	236
	%	28.8%	10.6%	3.0%	56.8%	0.8%	100.0%
29-40	Count	17	14	3	26	2	62
	%	27.4%	22.6%	4.8%	41.9%	3.2%	100.0%
41-50	Count	7	4	3	37	0	51
	%	13.7%	7.8%	5.9%	72.5%	0.0%	100.0%
51-64	Count	10	2	5	24	0	41
	%	24.4%	4.9%	12.2%	58.5%	0.0%	100.0%
65 and over	Count	3	0	0	7	0	10
	%	30.0%	0.0%	0.0%	70.0%	0.0%	100.0%
Total	Count	105	45	18	228	4	400
	%	26.3%	11.3%	4.5%	57.0%	1.0%	100.0%

#### Chi-Square Test

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.480	16	0.016
N of Valid Cases	400		

In this study, the issues that the participants should pay attention to when the current drugs need to be reused were examined. 36.8 % of the female participants and 56.4 % of the men participants stated that the suitability of the drug for the disease is important. In addition, 41.7 % of female participants and 26.7 % of men participants stated that they pay attention to the expiry date of the drugs. The results are statistically significant ( $\chi^2=26.179$ ;  $p<0.05$ ). Participants were asked from whom they received information when they wanted to use the medicines at home. According to the results, 87 (38.2 %) of the female participants and

68 (39.5 %) of the male participants were observed to consult the family physician. In addition, 44 (19.3 %) of female participants and 11 (6.4 %) of male participants were found to have consulted drugs to the pharmacist (**Table 6**). However, it was observed that 17 (7.5 %) of the female participants and 17 (9.9 %) of the male participants consulted the knowledge of their neighbors and relatives in drug use. This does not comply with rational drug use principles. Information about drug use should be done by a qualified physician or pharmacist<sup>9</sup>. The results are statistically significant ( $\chi^2=15.999$ ;  $p<0.05$ ).

**Table 6:** The rate and number of the participant's choices about drug information.

Gender		Informing about drug use					Total	
		Family doctor	Pharmacist	Nurse	Neighbor Relatives	Not necessary to inform		Other
female	Count	87	44	3	17	50	27	228
	%	38.2%	19.3%	1.3%	7.5%	21.9%	11.8%	100 %
male	Count	68	11	2	17	54	20	172
	%	39.5%	6.4%	1.2%	9.9%	31.4%	11.6%	100 %

### Chi-Square Test

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.999	5	0.007
N of Valid Cases	400		

There are a lot of people who prescribe drugs, although they do not need it because they think medicine may be necessary for the future. The opinions of the participants about this issue, most of whom are students, were evaluated. It was observed that 62 (27.2 %) of the female participants and 44 (25.6 %) of the male participants are prescribed medication, although they are not sick. It was also stated that 166 (72.8 %) of female participants and 126 (73.3 %) of male participants do not prescribe medication. The information given by the participants about what they want to do when they got sick was evaluated. According to the results, 110 (48.2 %) of the female participants and 103 (59.9 %) of the male participants stated that they consulted specialist physicians in their field. In rational drug use, patients and their relatives are asked to act in this way and consult a doctor who specializes in the field. Moreover, 38 (16.7 %) of female participants

and 7 (4.1 %) of male participants preferred phytotherapy methods. Considering the results, it was observed that the female participants were interested in phytotherapy methods. The results are statistically significant ( $\chi^2=32.405$ ;  $p<0.05$ ). One of the issues that conscious and rational drug utilization gives importance is the use of unnecessary antibiotics. In our study at Sivas Cumhuriyet University, we received the opinions of the participants on this subject. According to the result, 157 (68.9 %) of female participants and 114 (66.3 %) of male participants stated that they would not use antibiotics without doctor recommendation (**Table 7**). In addition, 30 (13.2 %) of female participants and 41 (18.0 %) of male participants stated that they use antibiotics without getting the examination. 68 (17.0 %) of the participants stated that they would conditionally use antibiotics and stop using them when they recover. The results are not statistically significant ( $\chi^2=1.919$ ;  $p>0.05$ ).

**Table 7:** The utilization of antibiotics on your own decision without an examination

		Utilization of antibiotics on your own decision without an examination			Total
		Yes	Conditional yes	No	
female	Gender				
		Count	30	41	157
	%	13.2 %	18.0%	68.9%	100.0%
male	Gender				
	Count	31	27	114	172
	%	18.0%	15.7 %	66.3%	100.0%
Total	Gender				
	Count	61	68	271	400
	%	15.3%	17.0 %	67.8%	100.0%

The use of vitamins and minerals regularly is important to the activity of the immune system and increase body resistance against diseases. For this reason, we evaluated the frequency of the participant's use of minerals and vitamins. The results show that 73 (32.0 %) of female candidates and 97 (56.4 %) of male candidates stated that they do not use vitamin and mineral supplements regularly. In addition, 119 (52.2 %) of female candidates and 41 (23.8 %) of male candidates stated that they use vitamin and mineral supplements when it is necessary. 12 (5.3 %) of female candidates and 24 (14.0 %) of male candidates stated that they receive vitamin and mineral supplements every day. Considering the results, it can be said that the majority of the participants do not have sufficient awareness in this regard.

## CONCLUSION

In conclusion, rational drug use is crucial for people's life but the results showed people do not have the necessary awareness of this issue. Therefore, it should be provided with sufficient and rational information about rational drug use to the people.

## Acknowledgements

The authors thank Prof. Dr. Yalçın Karagöz for his contribution to this study.

## REFERENCES

1. WHO. Essential medicines and health products. [http://www.who.int/medicines/areas/rational use](http://www.who.int/medicines/areas/rational_use) retrieved on 10.02.2020.
2. Türkiye Tıbbi Cihaz ve İlaç Kurumu. Akılcı İlaç Kullanımı. Neden Akılcı İlaç Kullanımı.

3. Akıcı A. Akılcı İlaç Kullanımının Genel İlkeleri ve Türkiye'deki Güncel Durum. Türkiye Klinikleri J Pharmacol-Special Topics 2015; 3(1): 1-10.
4. Rational drug use: prescribing, dispensing, counseling and adherence in ART programs; revised 06/2011; available at [http://www.who.int/hiv/amds/capacity/ken\\_msh\\_rational.pdf](http://www.who.int/hiv/amds/capacity/ken_msh_rational.pdf).
5. Akıcı A, Kalaça S. Toplumla Yönelik Akılcı İlaç Kullanımı. SGK Yayın No: 93. Ankara, Sosyal Güvenlik Kurumu Başkanlığı, 2013.
6. Türkiye Tıbbi Cihaz ve İlaç Kurumu. Akılcı İlaç Kullanımı. Hastane Hekim Anketi ve Değerlendirme Formu. <http://www.akilciilac.gov.tr/?cat=38> sayfasından 06.11.2017 tarihinde erişilmiştir.
7. Pharmacy intervention in the medication-use process. the role of pharmacists in improving patient safety; revised 09/2011; available at [http://www.fip.org/files/fip/Patient %20 Safety/ Patient Safety AdvidShah.pdf](http://www.fip.org/files/fip/Patient%20Safety/Patient_Safety_AdvidShah.pdf).
8. Cushing A, Metcalfe R, Optimizing medicines management: From compliance to concordance, Ther Clin Risk Manag. 2007; 3(6): 1047-1058.
9. WHO. The world medicines situations: chapter 8-rational use of medicines. 2010. Available online at: <http://apps.who.int/medicinedocs/en/d/Js6160e/10.html>. Accessed 9 Feb 2020.