TJFM&PC Turkish Journal of Family Medicine and Primary Care

RATIONAL DRUG USE STATUS OF STUDENTS AT A UNIVERSITY HOSPITAL

BİR ÜNİVERSİTE HASTANESİNDE ÖĞRENCİLERİN AKILCI İLAÇ KULLANIM DURUMU

Gökben YASLI[1], Ebru TURHAN[2]

Abstract

Objective: Irrational drug use is a significant global and public health issue, including in Turkey Turk. This study aims to assess the knowledge and attitudes of students toward rational drug use .

Methods: The study population comprised of 1909 students enrolled in Bakırçay University's 2019-2020 academic year. The sample size of the study was 780 students selected through stratified random sampling from each faculty. Data were collected using the "Rational Drug Use Form," which included demographic characteristics, background, drug use attitudes and behaviors, and the Rational Drug Use Scale. The data were analyzed using SPSS 23.0, and a p-value of <0.05 was considered statistically significant.

Results: Of the students, 74.4% were female, and 42.3% were male, with a mean age of 19.9. Of the students, 28.2% self-medicated before consulting a doctor when sick, and 57.6% used medication for headaches without consulting a doctor. Additionally, 73.6% of them primarily used over-the-counter painkillers. Based on the Rational Drug Use Scale score of ≥35, which is considered the cut-off point in the literature, 491 students (73.3%) knew about rational drug use

Conclusion: The students' knowledge of rational drug use was found to be above the average. However, campus courses and projects must be organized, and medical units should be supported, despite students' awareness of rational drug use

Keywords: Rational use of medicine, drug, student

Özet

Amaç: Akılcı olmayan ilaç kullanımı dünyada olduğu gibi Türkiye'de de önemli bir halk sağlığı sorunudur. Çalışmanın amacı; öğrencilerin akılcı ilaç kullanımı konusunda bilgi ve tutumlarını değerlendirmektir.

Yöntemler: Evreni, Bakırçay Üniversitesi 2019-2020 sınıfında öğrenim gören 1909 öğrenci oluşturmaktadır. Çalışma örneklemi 780 öğrenciyi içermektedir. Ankete katılan öğrenciler her bir fakülteden tabakalı tesadüfi örneklem yöntemi ile seçilmiştir. Araştırmada veri toplamak için "Akılcı İlaç Kullanım Formu" kullanılmıştır. Akılcı İlaç Kullanım Formu" sosyodemografik özellikler, özgeçmiş, madde kullanma tutum ve davranışlarını ve Akılcı İlaç Kullanım Ölçeğini içermektedir. Verilerin değerlendirilmesi SPSS 23.0 programı ile yapılmıştır. p<0.05 değeri istatistiksel anlamlılık düzeyi olarak kabul edilmiştir.

Bulgular: Araştırmaya katılan öğrencilerin %74.4'ü kız, %42.3'ü erkektir. Yaş ortalaması 19.9'dur Araştırmaya katılan öğrencilerin %28,2'si hasta olduklarında doktora başvurmadan önce kendi kendine tedavi için ilaç kullanmakta, %57, 6'sı ise doktora danışmadan baş ağrısı için ilaç kullanmaktadır. %73, 6'sı çoğunlukla reçetesiz ağrı kesici kullanmaktadır. Literatürde belirtilen kesme noktasına (Akılcı İlaç Kullanım Ölçeği Puanı≥35) göre Akılcı İlaç Kullanımı bilen öğrenci sayısı 491'dir (%73, 3).

Sonuç: Öğrencilerin Akılcı İlaç Kullanımı ile ilgili bilgi düzeylerinin ortalamanın üzerinde olduğu görülmüştür. Öğrencilerin akılcı ilaç kullanımı konusundaki farkındalığına rağmen, kampüslerde kurslar ve projeler düzenlenmeli, mediko üniteleri desteklenmelidir.

Anahtar kelimeler: Akılcı ilaç kullanımı, ilaç, öğrenci

Geliş tarihi / Received: 20.10.2022 Kabul tarihi / Accepted: 24.04.2023

[1]İzmir Provincial Directorate of Health Non-Communicable Diseases Unit, İzmir, Turkey
[2]Department of Public Health, Faculty of Medicine, Bakırçay University, İzmir, Turkey

Address for Correspondence / Yazışma Adresi: Gökben YASLI, İzmir Provincial Directorate of Health Non-Communicable Diseases Unit, İzmir, Turkey
E-posta: gokben.yasli@gmail.com Tel: +905055645747

Yaslı G & Turhan E. ***Rational Drug Use Status Of Students At A University Hospital.*** *TJFMPC, 2023;17 (2) :*283-295
DOI: 10.21763/tjfmpc.1192151

Introduction

The World Health Organization (WHO) has defined medicine as a product or substance intended for the benefit and improvement of an individual in a pathological or physiological condition. Drugs are products derived from chemical, herbal, or biological sources that are used to diagnose and cure disease. While the misuse of drugs can result in fatal consequences, their appropriate use can help to alleviate life-threatening situations, making them an essential component of the healthcare system. These definitions highlight the importance of drugs in the medical field and the need for their responsible use to prevent adverse effects.[1,2]

Undoubtedly, drugs are the essential weapon in human hands in the struggle to prevent and cure diseases. Therefore, accessibility to drugs is a fundamental right of humans. Also, according to the World Health Organization (WHO) (2002), easy drug access is one of the basic human rights. Ensuring equality and accessibility is an essential part of drug use policies in the long term. The Alma-Ata Declaration of 1978 states the highest level of healthcare possible is to be provided as both a fundamental human right and one of the most significant social targets in the world. Redundant, invalid, expensive, or misuse of drugs may cause many possible problems. These problems are an increase in morbidity and mortality rates, increasing the risk of drug-related effects, and misuse of resources in consumption.[3]Hence, multiple ways of solutions have been generated and developed. Thus, Rational Drug Use (RDU) research occurred. The WHO convention in 1985 in Nairobi is considered the beginning of the study on RDU. RDU is defined by the WHO as the accessibility of the appropriate drug, with a reasonable duration and dose, with the least cost possible and easy, based on their individual characteristics and clinical findings. Rational drug use enables more effective, safe, and economical administration of drug therapy with its implementation and follow-up processes. The World Health Organization estimates that more than 50% of medicines are improperly prescribed, procured, or sold. Half of the patients cannot use their medications properly.[4]

Non-Rational Drug Use (NRDU) can be defined as not implementing the procedures and rules the RDU requires. It contains excessive use of drugs, redundant use of expensive drugs, unnecessary use of injectable forms, redundant antibiotics, wrong indications, inappropriate doses, wrong durations of treatment, and others. Moreover, a lack of communication with the patient or an inability to inform the patient clearly and comprehensively can also lead to misusage of drugs. [5] Therefore, increase in morbidity and mortality rates, an increase in the risk of the side effects of drugs, a decrease in accessibility of drugs and even the essential drugs due to wrong consumption of resources, increase in economic and social costs of treatment based on resistance to emergency and essential medicines and others can be considered as consequences of the Non-Rational Drug Use.[6] In conclusion, NRDU increases the risks of mortality and morbidity, hence applications to the hospital for outpatient or inpatient treatments. This leads to a burden on the economy and the healthcare system while reducing public truin to the healthcare system.[7,8,9] Hence, multiple ways of solutions are being developed in the world. Therefore, Rational Drug Use research has begun (RDU National Action Plan, 2014-2017). With the "RDU National Action Plan 2014-2017" fieldwork starting in Turkey, the 17.629 billion Turkish liras annual expense in medicine in 2014 turned to 16.951 billion Turkish liras yearly cost in 2015, as reported.[10] The most common medicine in NRDU is antibacterial drugs, cardiovascular system drugs, oral anticoagulants, theophylline, and antineoplastic drugs.[11] The reasons for Non-Rational Drug Use (NRDU) are considered as a lack of of both users and providers, insufficiency of the medical curriculum, lack of communication between healthcare professionals and patients, lack of diagnostic facilities, patient demands on prescription, non-efficient regulations on drugs and promotion activities of pharmaceutical companies.[12]

The research applied to university students have shown that university students use medicine without a prescription and most of those medicines are painkillers. It is observed that university students do not use their medication properly and they do not read the prospectus.[13,14,15] As an incentive for rational drug use, the WHO suggestedaddingpharmacotherapy on university curriculums.[16] In addition to the mandatory classes on the rational drug use on university curriculums, the awareness and knowledge of the students can be raised by panels, lectures, and conferences. This study aims to assess the knowledge levels and attitudes of universıty students at Bakırçay Unıversity regarding rational drug use.

Material and Method

Study Design

This study was designed as descriptive and cross-sectional.

Population and sample of the research

The population of the research is 1909 students studying at the Menemen Vocational School, Faculty of Arts and Sciences, Faculty of Law, Faculty of Health Sciences, Faculty of Engineering and Architecture, Faculty of Economics and Administrative Sciences of Bakırçay University in the 2019-2020 academic year. The sample consists of 780 students who voluntarily participated in the study from this universe. The sample size was calculated using the sample size method with the unknown population size, accepting the incidence of the event as 50%, the margin of error of 0.03, and the reliability level of 97%. As a result of the calculations, 780 students of the Bakırçay University for survey application were projected. The students from each faculty-student group were selected by stratified random sampling method. After stratification, equal proportions of samples were selected from each school department using the simple random method. The criteria to be included in the study is tvolunteer and to be discluded is not filling out the survey properly.

The permission of the Bakırçay University Non-Invasive Clinical Research Ethics Committee (19.06.2020; 39) was obtained. To use the rational drug use scale in the study, permission was obtained from the author. During data collection, necessary explanations were made and consent forms were obtained from the students. The data collection form was distributed to the students at the end of the course and collected back after completion.

Statistical Analysis

Statistical analyzes were made with the IBM SPSS 23.0 program. The mean ± standard deviation is given in summarizing the numerical variables. Categorical variables are summarized as numbers and percentages. The Kolmogorow-Smirnov test was used to determine whether the data were suitable for normal distribution. The Chi-square test was used in the comparison and compared by counting between groups. $p<0.05$ value was accepted as the statistical significance level.

Data Collection Tools

As a data collection tool, the "Rational Drug Use Form" created by the researchers by scanning the literature was used for data collection in the study (49 questions). “Rational Drug Use Form" consists of three parts. The first part contains questions (14 questions) about sociodemographic characteristics and personal history characterized, educational status, income level, the presence of physician-diagnosed chronic disease (regular drug use). The second part contains questions (21 questions) about the attitude and behavior of using the drug in the appropriate form, amount, and time in case of illness. The third part includes the Rational Drug Use Scale, which evaluates the level of knowledge about rational drug use (21questions). Cronbach's alpha internal consistency coefficient was calculated as 0.782. The rational Drug Use Scale was developed by Demirtaş et al.[17] Permissions that are required were obtained for the use of the scale. The answers given to the scale are scored using points; Yes: 2 points, I don't know: 1 point, No: 0 points. Items 2, 5, 6, 9, 10, 13, 15, 16, 17, 19, 20 are reverse propositions and scored vice versa. As the scores obtained from the scale increase, the level of knowledge of rational drug use increases. The predictive vehicle is stated as 34 points, and it can be evaluated as knowing rational drug use with 35 points or more or as the level of rational drug use increases as the score obtained from the scale increases. The participants were informed beforehand to apply the questionnaire and the scale, and their verbal consent will be taken. The questionnaire form was administered by the method of self-filling under the supervision of the researchers.

Results

57.4% Of the students, 57.4% are female and 42.6 % are male. The average age is 19.9 years, 61.1% are first-grade students. Of them, 97.9% of are single. The faculties of the students are as in percentage: 27.6% Health Sciences, 23.3% Arts and Sciences, 19.5% Engineering and Architecture, 17.2% Economics and Administrative Sciences, 6.2% Law, and 6.1% Menemen Vocational School. The income status of the families of the students participating in the research is 83.5% medium. Education level of 75.6% of mothers are primary, secondary, or high school graduates, and 70.9% of them are not working. The education level of 71.3% of the fathers is a primary, secondary, or high school graduates, and 77.9% of them are not working, 75.3% of the students have health insurance, and 86.8% do not have a chronic disease (Table 1).

Table 1. *Distribution of demographic characteristics of the students*

		n	%
Age(years)		19.9±1.9	
Gender	Female	386	57.4
	Male	287	42.6
Faculty	Faculty of Arts and Sciences	157	23.3
	Faculty of Law	42	6.2
	Faculty of Economics and Administrative Sciences	116	17.2
	Faculty of Architecture and Engineering	131	19.5
	Faculty of Health Sciences	186	27.6
	Menemen Vocational School	41	6.1
Grade	1st grade	411	61.1
	2nd grade	136	20.2
	3rd grade	85	12.6
	4th grade	41	6.1
Marital status	Single	659	97.9
	Married/Engaged	14	2.1
Income status of the family	Low	90	13.4
	Medium	562	83.5
	High	21	3.1
Education level of the mother	??Illiterate	70	1.4
	Elementary/Middle/High school	509	75.6
	Vocational school/University	94	14.0
Employment status of the mother	Employed	196	29.1
	Unemployed	477	70.9
Education level of the father	00/ ??Illiterate	27	4.0
	Elementary/Middle/High school	480	71.3
	Vocational school/University	166	24.7
Employment status of the father	Employed	524	77.9
	Unemployed	149	22.1
Health insurance	No	166	24.7
	Yes	507	75.3
The living status of the participant student	With family	198	29.4
	Home alone / home with a roommate	212	31.5
	Dormitory/hostel/with another family/ others	263	39.1
Chronic diseases	No	584	86.8
	Yes	89	13.2

Of the students, 28.2% use medication for self-treatment before consulting a doctor when they are ill, 57.6% of them mostly do without consulting a doctor for a headache, 73.6% of them use painkillers the most, and 64.0% of them use unprescribed medicine when it is the medicine they used before (Table 2).

Table 2. *Characteristics of the attitudes and behaviors of the students participating in the research about what they do in case of illness*

		n	%
Do you use medication to treat yourself before consulting a doctor when you are sick?	Yes	189	28.2
	No	225	33.6
	Often	256	38.2
For which of your diseases do you most often use medicine without consulting a doctor?	I do not use medicine without consulting a doctor	97	16.6
	Headache	336	57.6
	Flu	89	15.3
	Menstruation pain	28	4.8
	Acid reflux/stomach pain	21	3.6
	Others	12	2.1
Which drugs do you use most without consulting a doctor?	I do not use medicine without consulting a doctor	75	12.8
	Pain killers	430	73.6
	Antibiotics	4	0.7
	Flu medicines	54	9.2
	Vitamins	17	2.9
	Others	4	0.7
If so, what is your reason for using unprescribed medication?	I do not use drugs without prescription	203	30.8
	Because I used the medicine before	422	64.0
	Because I did not have time to see a doctor because I studied hard	19	2.9
	Economic reasons	3	0.5
	Because I do not have insurance	2	0.3
	Others	10	1.5
Do you use drugs on the advice of people other than health personnel (relatives, friends, neighbors, etc.)?	Yes	101	15.1
	No	410	61.1
	Often	160	23.8
Would you recommend drugs to others (relatives, friends, neighbors, etc.) to use?	Yes	83	12.4
	No	463	69.0
	Often	125	18.6
Do you want information from the doctor about the medicines prescribed?	Yes	431	64.2
	No	88	13.1
	Often	152	22.7
Before you start using the prescribed medicine, do you read the explanations on the medicine box and the prospectus/explanations on the medicine?	Yes	455	76.8
	No	59	8.8
	Often	157	23.4
Do you take your medicine the way the doctor recommended you?	Yes	615	91.7
	No	9	1.3
	Often	47	7.0
Before using the medicine, do you check the expiration date of the medicine?	Yes	480	71.6
	No	78	11.6
	Often	112	16.7
When you take your medicine from the pharmacy, do you check that the medicine is the same as the prescribed medicine?	Yes	356	53.1
	No	209	31.1
	Often	106	15.8
Do you ask for a prescription to keep medicine at home?	Yes	154	23.0
	No	365	54.5
	Often	151	22.5
If you take some of the prescribed medicine but not all of them, can you explain why?	I use all of them	301	46.1
	I do not get the ones that I already have at home	232	35.5
	I do not take the unnecessary ones	41	6.3
	I do not get the expensive ones	18	2.8
	I do not take all of them because too much medicine is unhealthy for my body	30	4.6
	Because of the side effects	27	4.1
	Others	4	0.6

Table 2 (continued). *Characteristics of the attitudes and behaviors of the students participating in the research about what they do in case of illness*

Who do you prefer primarily to get information about medicine?	Doctor	434	67.4
	Pharmacist	108	16.8
	Nurse	4	0.6
	People that I know who used that medicine before	20	3.1
	Prospectus	42	6.5
	Internet	34	5.3
	Others	2	0.3
When do you stop taking medicine after you start taking it?	When the symptoms disappear	285	44.2
	When the duration advised by the doctor ends	327	50.7
	When I decide the duration recommended is too much	7	1.1
	When I forget	18	2.8
	When I do not want to take medicine anymore	7	1.1
	Others	1	0.2
Who do you consult primarily when you experience an unwanted side effect?	I do not consult	41	6.2
	Doctor	546	82.9
	Pharmacist	29	4.4
	People I know that used the medicine before	24	3.6
	Others	19	2.9
What do you do when you do not feel the benefit from the medicine?	I quit taking the medicine	164	25.3
	I consult the doctor	309	47.7
	I keep using it	43	6.6
	I quit taking medicine and consulted the doctor	131	20.2
	Others	1	0.2
Where do you keep your medicine?	At the room temperature	264	40.5
	In a medicine cabinet	101	15.5
	In the fridge	160	24.5
	Depending on the temperature, the fridge in the summer and medicine cabinet in the winter	82	12.6
	I check the temperature recommended on the box	43	6.6
	Others	2	0.3
What do you do with the leftover medicine after the treatment?	I do not keep them	43	6.5
	I will keep them in case I need to use them again	497	75.2
	I throw them in the garbage	88	13.3
	I give them away to people who need the medicine	5	0.8
	I return them to the health facilities	24	3.6
	Others	4	0.6
Do you use the medicine if you feel distressed, sad, stressed, or depressed?	Yes	47	7.1
	No	581	87.5
	Often	36	5.4
When ill, do you use alternative treatments (nutritional supplements, herbal treatments, acupuncture, etc.)?	Yes	362	54.5
	No	170	25.6
	Often	132	19.9

The answer was "The doctor" to the question "Who do you consult primarily when you experience an unwanted side effect?" by 82.3% of the 1st graders, 88.1% of the 2nd graders, 72.9% of the 3rd graders, and 92.3 of the 4th graders (p=0.039). To the question "What do you do with the leftover medicine after the treatment?" the answer was "I will keep them in case I need to use them again" by 75.6% of the first graders, 73.7% of the 2nd graders, 85.4% of the 3rd graders and 55.0% of the 4th graders (p=0.000) (Table 3).

Table 3. *Student's behavior in the case of an illness according to their sociodemographic attributes*

		I do not use medicine without consulting a doctor	Headache	Flu	Menstruation pain	Acid reflux/stomach pain	Others	p
		%(n)	%(n)	%(n)	%(n)	%(n)	%(n)	
For which of your diseases do you most often use medicine without consulting a doctor?	Female	11.4(36)	59.9(190)	15.5(49)	8.5(27)	2.8(9)	1.9(6)	
	Male	22.9(97)	57.6(336)	15.3(89)	0.4(1)	4.5(12)	2.3(6)	p<0.001
		I do not use medicine without consulting a doctor	Painkillers	Antibiotics	Flu medicines	Vitamins	Others	
Which drugs do you use most without consulting a doctor?	Female	8.0(26)	80.2(259)	0.9(3)	8.7(28)	1.9(6)		p<0.001
	Male	18.8(49)	65.5(171)	0.4(1)	10.0(26)	4.2(11)		
		I do not use drugs without prescription	Because I used the medicine before	Because I did not have time to see a doctor because I studied hard	Economic reasons	Because I do not have health insurance	Others	
If so, what is your reason for using unprescribed medication?	Female	23.5(89)	72.5(274)	2.1(8)	0.5(2)	0(0.0)	1.3(5)	
	Male	40.6(203)	64.0(422)	2.9(19)	0.4(1)	0.7(2)	1.8(5)	p<0.001
		I use all of them	I do not get the ones that I already have at home	I do not take the unnecessary ones	I do not get the expensive ones	I do not take all of them because too much medicine is unhealthy for my body	Because of the side effects	
If you are taking some of the prescribed medicine but not all of them, can you explain the reason for this?	Female	42.9(161)	40.5(152)	5.9(22)	2.1(8)	4.8(18)	3.7(14)	0.017
	Male	50.4(140)	28.8(80)	6.8(19)	3.6(18)	4.3(12)	4.7(13)	
		I quit taking the medicine	I consult the doctor	I keep using it	I quit taking medicine and consulted the doctor	Others		
What do you do if you don't feel the benefit from the medicine?	Female	26.0(97)	44.5(166)	4.8(18)	24.7(92)	0(0.0)		
	Male	24.4(67)	52.0(143)	9.1(25)	14.2(39)	1(0.4)		0.003

Table 3 (continued). *Student's behavior in the case of an illness according to their sociodemographic attributes*

		I do not consult	Doctor	Pharmacist	People I know that used the medicine before	Others		
Who do you consult primarily when you experience an unwanted side effect?	1st grade	6.5(26)	82.3(330)	5.0(209	4.0(16)	2.2(9)		
	2nd grade	3.7(5)	88.1(118)	3.7(5)	1.5(2)	3.0(4)		0.039
	3rd grade	11.8(10)	72.9(62)	4.7(4)	7.1(6)	3.5(3)		
	4th grade	0.0(0)	92.3(36)	0.0(0)	0.0(0)	7.7(3)		
		I do not keep them	I will keep them in case I need to use them again	I throw them in the garbage	I give them away to people who need the medicine	I return them to the health facilities	Others	
What do you do with the leftover medicine after the treatment?	1st grade	6.9(28)	75.6(307)	14.3(58)	0.5(2)	2.5(10)	0.2(1)	
	2nd grade	3.0(4)	73.7(98)	13.5(18)	1.5(2)	7.5(10)	0.8(1)	p<0.001
	3rd grade	4.9(4)	85.4(70)	6.1(5)	1.2(1)	0(0.0)	2.4(2)	
	4th grade	17.5(7)	55.0(22)	17.5(7)	0(0.0)	10.0(4)	0(0.0)	
		I do not use medicine without consulting a doctor	Painkillers	Antibiotics	Flu medicines	Vitamins	Others	
Which drugs do you use most without consulting a doctor?	Does not have a health insurance	20.3(31)	68.6(105)	0(0.0)	9.2(14)	2.0(3)		0.023
	Has a health insurance	10.2(44)	75.4(325)	4(0.9)	9.3(40)	0(0.0)		
		I do not use drugs without prescription	Because I used the medicine before	Because I did not have time to see a doctor because I studied hard	Economic reasons	Because I do not have health insurance	Others	
If so, what is your reason for using unprescribed medication?	Does not have a health insurance	40.2(66)	53.7(88)	2.4(4)	0.6(1)	1.2(2)	1.8(3)	0.006
	Has a health insurance	27.7(137)	67.5(334)	3.0(15)	0.4(2)	0(0.0)	1.4(7)	
If you take some of the prescribed medicine but not all of them, can you explain why?		I use all of them	I do not get the ones that I already have at home	I do not take the unnecessary ones	I do not get the expensive ones	I do not take all of them because too much medicine is unhealthy for my body	Because of the side effects	
	Does not have a health insurance	39.0(64)	36.0(59)	9.8(16)	5.5(9)	4.9(8)	4.3(7)	0.050
	Has a health insurance	48.5(237)	35.4(173)	5.1(25)	1.8(9)	4.5(22)	4.1(20)	

Row percentage is taken. A Chi-square test was used, with a significance level of $p < 0.05$

Table 4. *Distribution of the students' answers to the questions on rational drug use*

	Yes (%/n)	No(%/n)	I don't know(%/n)
1) Only doctors can advise medicine.	69,1(455)	19,9(131)	10,9(72)
2) Advancing medicine to people with similar complaints is no harm.	13,2(87)	11,7(77)	75,1(494)
3) The doctor obtains if we need medical treatment or not when we are ill.	95,6(627)	2,9(19)	1,5(10)
4) Medicine can have negative effects as much as they have positive.	97,6(641)	1,5(10)	0,9(6)
5) All the medicines have the same side effects.	3,7(24)	92,4(607)	4,0(26)
6) There is no harm in taking medicine more frequently than the doctor advised.	9,0(59)	81,5(536)	9,6(63)
7) It can be learned from the prospectus if you need to use the medicine on an empty or full stomach.	77,9(5)	9,4(62)	12,6(83)
8) It may prevent healing if you do not use the medicine for the specific duration the doctor advised.	76,7(504)	12,8(84)	10,5(69)
9) Herbal products can replace medicine.	26,4(174)	42,2(278)	31,3(206)
10) There is no harm in consuming herbal products as much as wanted.	9,3(61)	71,3(467)	19,4(127)
11) We should consult our doctor if we experience an unwanted side effect.	98,2(645)	1,1(7)	0,8(5)
12) We should inform our doctor while he is planning our treatment.	97,4(640)	0,8(5)	1,8(12)
13) We can quit taking our medicine if we feel better during the treatment.	26,3(173)	51,6(339)	22,1(145)
14) We can ask our pharmacist to keep our medicine at home.	88,1(577)	6,1(40)	5,8(38)
15) The duration of the treatment is the same for all medicines	13(2,0)	94,5(622)	3,5(23)
16) Herbal products are completely harmless.	21(3,2)	76,7(504)	20,1(132)
17) Medicines can be used in the same amount for all age groups.	2,0(13)	93,6(613)	4,4(29)
18) Rather than using a lot of drugs, using sufficient drugs contributes to our healing.	90,7(596)	3,5(23)	5,8(38)
19) More expensive drugs are more efficient.	3,5(23)	90,3(594)	6,2(41)
20) Any medicine can be taken during pregnancy.	1,7(11)	91,8(604)	6,5(43)
21) Some medicines tend to cause addiction.	77,5(510)	3,8(25)	18,7(123)

In the study, the internal consistency coefficient (Cronbach alpha) of the RDUQ (Rational Drug Use Questionnaire) was obtained as 0.782. The total RDUQ score obtained from the answers of the students varies between 17 and 47, and the median of the RDUQ score is 37. According to the cut-off point specified in the literature (RDUQ score≥35), The number of students with RDU knowledge is 491 (73.3%).

While 80.1% of the female students participating in the research had a high level of knowledge in RDU, 72.0% of the male students had a high level of knowledge in RDU (p=0.017). Fifty percent of the participants whose fathers are illiterate/literate , have a high level of knowledge on RDU, while 77.2% of the participants whose fathers' education level is elementary/middle/high school have high knowledge on RDU (p=0.006)(Table 5).

Table 5. *The relevance between sociodemographic characteristics of the students and their behavior of rational drug use*

		Low level of information		High level of information		p
		N	%	n	%	
Gender	Female	74	19,9	298	80,1	0,017
	Male	75	28,0	193	72,0	
Age (years)	18-19	69	24.5	213	75.5	0.528
	20 and higher	80	22.3	278	77.7	
Faculty	Faculty of Arts and Sciences	36	23,8	115	76,2	0,945
	Faculty of Law	9	22,0	32	78,0	
	Faculty of Economics and Administrative Sciences	24	20,9	91	79,1	
	Faculty of Engineering and Architecture	32	26,2	90	73,8	
	Faculty of Health Sciences	40	23,3	132	76,7	
	Vocational School	8	20,5	31	79,5	
Grade	1st Grade	91	23,5	296	76,5	0,837
	2nd Grade	32	24,2	100	75,8	
	3rd Grade	16	19,5	66	80,5	
	4th Grade	10	25,6	29	74,4	
Education level of the father	Illiterate/Literate	12	50.0	12	50.0	0.006
	Elementary/Middle/High School	105	22.8	355	77.2	
	Vocational school/University	32	20.5	124	79.5	
Education level of the mother	Illiterate/Literate	20	29.9	47	70.1	0.358
	Elementary/Middle/High School	111	22.9	374	77.1	
	Vocational school/University	18	20.5	70	79.5	
Income	Low	22	25.9	63	74.1	0.151
	Medium	119	22.2	416	77.8	
	High	8	40.0	12	60.0	
The employment status of the mother	Employed	36	19.1	152	80.9	0.111
	Unemployed	113	25.0	339	75.0	
The employment status of the father	Employed	117	23.5	380	76.5	0.772
	Unemployed	32	22.4	111	77.6	
Chronic diseases	No	129	23.2	426	76.8	0.954
	Yes	20	23.5	65	76.5	

Row percentage is taken. A Chi-square test was used, with a significance level of $p < 0.05$

Discussion

In this study conducted with Bakırçay University students, the knowledge level of the students on RDU was found above the average, 28.2% of the students who participated in the research use medicine without consulting a doctor, 57.6% of them mainly for headaches. The reason for using unprescribed medicine is 73.6% because it is painkillers and 64.0% because they have used the medicine before. 59.9% of the female and 57.6% of the male students have given the answer "Headache" to the question "For which of your diseases do you most often use medicine without consulting a doctor?". To the question "Which drugs do you use most without consulting a doctor?", 68.6% of the participants that have no health insurance and 75.4% of the participants who have health insurance have given the answer "Painkillers." In the study conducted by Pınar N with the medical school students, the question "Do you use medicine without consulting a doctor?" was answered as "Yes" by 22.2% of the female and "Often" by 55.6% while 28.6% of the male answered as "Yes and 44.4% of them responded as "Often.[18] In the study conducted by Karakurt et al. amongst university students, it was obtained that 70.3% of the students use unprescribed medicine when they have a headache, 61.5% of them use analgesic medicine without a prescription, 64.1% of them stated that they use unprescribed medicine in case they use a medicine they used before, and 66.8% of them mostly use unprescribed medicine for a headache.[19] This may be a result of painkillers being known as they have milder side effects, are more affordable, and are able to be purchased without a prescription. Moreover, it is significant that students do not use without a doctor's advice, and no side effects and drug resistance occur.

In response to the questıon "If so, what is your reason for using unprescribed medication?", 53.7% of the students who do not have health insurance and 67.5% who have health insurance have answered, "Because it is a medicine I used before." 80.2% of the females and 65.5% of the participants responded as "Painkillers" to the question "Which drugs do you use most without consulting a doctor?", 72.5% of the female and 64.0% of the male participants have stated their reason for using unprescribed medicine is they do it if they had used the medicine before. In the study conducted by Deniz S. in Istanbul, 52.3% of the male students and 54.4% of the female students did not use over-the-counter drugs, 82.3% of them used painkillers without a prescription, 20.3% of them stated that they had experience with that drug.[20] In the study by Kuyifatih et al. at Ankara University, 60.2% of the participants stated that they use unprescribed medicine and the most common use of unprescribed medicine is with the percentage 52.1% painkillers.[21] While this study is evaluated with the other studies, the conclusion is that participants do consult a doctor while they're ill but partially behave through their previous experiences. Especially younger age groups tend to behave this way more than the other age groups. The reason may be their unwillingness to go through the hospital bureaucracy or their carelessness on their symptoms. Especially the analgesics being frequently used unprescribed may have the reason this medicine is affordable without a prescription, but the side effects and medical resistance should also be considered.

In the study, 61.1% of the students have given the answer "No" to the question "Do you use drugs on the advice of people other than health personnel (relatives, friends, neighbors, etc.)?" and 69.0% of them responded as "No" to the question "Do you recommend medicine to other people?". In the study conducted by Deniz S., 28.4% of the participants use medicine on the advice of other people than health personnel.[20] In the study Pınar N. conducted in Mustafa Kemal University Medical School, the percentage of not using the medicine on friends' advice is 55.6%, while the percentage of not advising medicine family and friends is 66.7%. [18] These two studies concluded similar results. The study conducted by Kukula in medical school stated that 87.5% of the students only use the medicines that were advised by a doctor.[22] It can be said that students do not get advice from other people when it is a significant subject like health.

To the question "Do you ask for further information from the doctor about the medicine prescribed" 64.2% of the students, to the question "Before you start using the prescribed medicine, do you read the explanations on the medicine box and the prospectus/explanations on the medicine?" 76.8% of the students, to the question "Do you take your medicine the way the doctor recommended you?" 91.7% of the students, to the question "Do you check the expiration date before using the medicine" 71.6% of the students, to the question "When you take your medicine from the pharmacy, do you check that the medicine is the same as the prescribed medicine?" 53.1% of the students answered "Yes." To the question "Who do you consult primarily when you experience an unwanted side effect?" 82.3% of the 1st-grade students, 88.1% of the 2nd-grade students, 72.9% of the 3rd-grade students, and 92.3% of the 4th-grade students have responded "the doctor." In the study of Kuyifatih and Karakurt et al., similar to the results of this study, it was shown that a high percentage of students rely on doctors as a source to obtain the drug and read the instructions about the drug [21,24]. These results show that young people have positive attitudes towards drug use. For the expected effect of medicine to occur, it is significant to know the correct way of use and to check the expiration date. In addition, it greatly impacts the country's economy in terms of not wasting resources and not increasing public health expenditures

Of the students, 54.5% responded as "No" to the question "Do you ask for a prescription to keep medicine at home?", 46.1% of them use all the medicine prescribed, while 67.4% prefer the doctor primarily to consult for further information on their medicine. To the question "If you are taking some of the prescribed medicine, but not all of them, can you explain the reason for this?", 39% of the students without health insurance and 48.5% of the students with health insurance have answered, "I use all of them." In the literature, it is observed that the existence of social security

and economic status are determinants in the supply of drugs.[24,25] The ratio of selecting medicine out of prescription to use is higher among the students without health insurance. This may be a result of health expenses, they may be selecting the more affordable medicines in their prescription. Hence, their income level affects their behavior of drug use. In this research, it is also a high percentage of students who ask for a prescription to keep medicine at home. Keeping medication at home is a habit caused either by non-compliance with treatment or by prescribing too many medications. In this case, it does not comply with rational drug approaches.

O)f the students, 50.7% quit their medicine at the end of the duration that their doctor has recommended, and 47.7% consult their doctor first if they do not feel the benefit of the medicine. Karakurt et al. found that 47.9% of university students quit their medicine once they did not feel the symptoms.[24] In the study by Deniz S. in Istanbul, the result is 48.6% for using the medication according to the duration that the doctor has recommended.[20] In general sense, students quit their medicine once they feel the symptoms are done. However, following the doctor's advice and using the medication as the doctor recommended is highly significant to ensure success in treatment and prevent the diseases from reoccurring.

While 40.5% of the participants in the study kept their drugs at room temperature, 75.2% of them left drugs at home after treatment in case they had to use it again. When asked whether they used medication when they were distressed, sad, stressed or depressed, 7.1% answered “Yes” when asked whether they used alternative treatments when they were sick, and 54.5% answered “Yes”. Karakurt et al. found that 7.8% of the students used drugs when they were stressed.[24] In Pınar N.'s study among medical faculty students, 45.8% of females and 31.9% of males stated that they use herbal medicine, which is lower than our results since this study was conducted with medical school students. [14] " In this study, 42.9% of females and 50.4% of males answered “I use all of them” to the question “If you are taking some of the prescribed medications, can you explain why?". To the question “What do you do with the leftover medicine after treatment?” 75.6% of the 1st grade students, 73.7% of the 2nd grade students, 85.4% of the 3rd grade students and 55.0% of the 4th year students stated that they keep the medicine at home in case if they need to use it again. To the question "What do you do when you don't see any benefit from the medicine?" 44.5% of the female and 52.0% of the male replied as "I consult to a doctor". However, behaviors such as not benefiting from medical treatment, using traditional and complementary medicine practices, changing the dose and number of drugs, discontinuing the use of medicines at the end of the symptom, and using the medicines that are kept at home without a prescription in case of illness can be classified as irrational drug use behaviors

In this study, the median total score obtained from the answers of students in the NRDU (National Rational Drug Use) questionnaire was found to be 37, which is similar to the result reported in the study conducted by Kurt et al. The level of knowledge was significantly different between students with uneducated fathers (50.0%) and those with educated fathers (77.2%). The female gender and father's education were found to be significant factors affecting RDU behavior. This result is higher than the result of the study conducted by Akkaya and Kocaşlı among students at Gümüşhane University[26] The participants' sociodemographic characteristics such as age, faculty, grade, mother's education, income status, mother and father's employment statuses, and existence of chronic disease did not have a statistically significant effect on RDU behavior.

However, the research has some limitations, such as being conducted by researchers from two different institutions and the difficulty in arranging the course hours for the students to answer the questionnaires. Despite these limitations, the participation rate of 86% is considered quite high. The study is important as it draws attention to the issue of rational drug use and provides support to the existing literature.

Conclusion

The study found that the students’ level of knowledge regarding rational drug use (RDU) was higher than the average. Therefore, it is recommended that universities should strengthen the knowledge of their students by organizing events such as conferences, lectures and panel discussions. Additional guidance and counseling programs should be developed to promote rational drug use.

Abbreviations

WHO: World Health Organization, RDU: Rational Drug Use, NRDU: Non-Rational Drug Use.

Acknowledgments

Thank you to all students who patiently answered our survey questions.

Funding

No specific funding for received for this study.

Conflicts of Interest

The authors declare that they have no competing interests.

References:

1. 1. Barutçu İA, Tengilimoğlu D, Naldöken Ü. Citizens rational use of drugs, evaluation of knowledge and attitude: the case of Ankara province metropol districts. Journal of Ankara Hacı Bayram Veli University Faculty of Economics and Administrative Sciences. 2017; 19(3):1062.
2. 2. Pınar N. Pharmaceutical expenditures in our countr. Journal of Inonu University Medical Faculty. 2012; 19(1):59-65.
3. Gürhan B. Evaluation of patients applying to a university hospital in terms of rational drug use principles, specialization thesis in medicine. T.C. Ankara University Faculty of Medicine. 2016;1-82.
4. World Health Organization. The rational use of drugs: report of the conference of experts Nairobi, 1985;1-12. World Health Organization. 1987.
5. World Health Organization (WHO). Effective public education. Promoting rational drug use. WHO programme on essential drugs and international network for the rational use of drugs, Nairobi. 1987;1-101.
6. Republic of Turkey ministry of health Turkey medicines and medical devices agency, rational use of medicines https://www.titck.gov.tr/faaliyetalanlari/ilac/akilci-ilac-utilimi. Access Date: 27.06.2022.
7. De Vries, T. P. G. M, Henning, R. H, Hogerzeil, Hans V, Fresle, D. A WAP on ED. Guide to good prescribing: a practical manual. WHO/DAP/94. World Health Organization. 1994;1-142.
8. Hogerzeil H V. Promoting rational prescribing: an international perspective. British Journal of Clinical Pharmacology. 1995; 39: 1–6.
9. Jatinder S. International network for rational use of drugs. Indian Journal of Pharmacology. 2003; 35(2):125-126.
10. Pharmaceutical industry employers union basic indicators. Turkish pharmaceutical market http://www.ieis.org.tr/ieis/tr/indicators/33/turkiye-ilac-pazari). Accessed on: 20.06.2022.
11. Krähenbühl-Melcher A, Schlienger R, Lampert M, Haschke M, Drewe J, Krähenbühl S. Drug-related problems in hospitals: a review of the recent literature,.Drug Safety. 2007; 30:379-407.
12. 1Saygili M, Ozer O. Evaluation of physicians knowledge, attitudes and behaviors towards rational drug use. Hacettepe Journal of Health Administration. 2015; 18(1):35-46.
13. Açıksöz, S, Kurt, G. ve Seyfi, M. (2020). "Hemşirelik Öğrencilerinin Reçetesiz İlaç Kullanma Durumları". Koç Üniversitesi Hemşirelikte Eğitim ve Araştırma Dergisi, 17 (1), 17-23. doi:10.5222/HEAD.2020.017
14. Kurt, O, Oğuzöncül, A. F, Deveci, S. E. ve Pirinçci, E. (2020). "Bir Sosyal Bilimler Meslek Yüksekokulu Öğrencilerinin Akılcı İlaç Kullanımı Konusunda Bilgi ve Davranışlarının Değerlendirilmesi". ESTÜDAM Halk Sağlığı Dergisi, 5 (1), 62-72.
15. Karaman, A, Ayoğlu, T, Aydoğan, MN. ve Kuğu, E. (2019). "Hemşirelik Öğrencilerinin Akılcı İlaç Kullanma Durumları". Florence Nightingale Journal of Nursing, 27 (2), 143-156.
16. World Health Organization. (2002). "WHO Policy Perspectives on Medicines. Promoting Rational Use of Medicines: Core Components". Geneva, Sep. Erişim adresi: https://apps.who.int/iris/bitstream/handle/10665/67438/WHO_EDM_2002.3.pdf?sequence=1&isAllowed=y (Erişim tarihi: 19.02.2022).
17. Demirtaş Z, Dağtekin G, Sağlan R, Alaiye M, Önsüz MF, Işıklı B, et al. Rational drug use scale was developed by Demirtaş et al. ESTUDAM Journal of Public Health. 2018;3(3):37-46.
18. Pınar N, Determination of rational drug use habits of Mustafa Kemal university medical faculty students. Mustafa Kemal University Medical Journal. 2017; 8(29): 34-40.
19. Karakurt, P, Hacıhasanoğlu, R, Yıldırım, A. and Sağlam. R. drug use in university students, TAF Prev Med Bull. 2010; 9 (5): 505-512.
20. Deniz S, A research on the determination of attitudes and behaviors regarding rational drug use. Hacettepe journal of health administration, 2019; 22(3): 619-632.
21. Kuyifatih, A. Yenimahalleli Y,Günaltay M. M. rational drug use: an application at Ankara university faculty of health sciences. Fiscaoeconomy. 2022; 6 (1): 251-277.
22. Kukula O. Evaluation of knowledge and behaviors of students in faculty of medicine towards rational drug use. Turk J Clin Lab. 2019; 11: 294-300.
23. Kuyifatih, A. Yenimahalleli Y, Günaltay M. M. Rational drug use: an application at Ankara university faculty of health sciences. Fiscaoeconomy. 2021; 2 (3):156-162.
24. Kurt, O, Oğuzöncül, A. F, Deveci, S. E., and Pirinçci, E. (2020). Assessment of knowledge and behavior of students of a vocational school of social sciences on rational drug use. ESTUDAM Journal of Public Health.2020; 5 (1): 62-72.
25. Gökalp O, Mollaoğlu, H. Improper drug use. Journal of Süleyman Demirel University Faculty of Medicine. 2003;10 (2): 17-20.
26. Akkaya A, Koçaşlı S. Determination of the level of rational drug use knowledge of students at the faculty of health sciences of a university. Gümüşhane University Journal of Health Sciences. 2022; 11 (1): 246-256.