Research Article / Araştırma Makalesi

Evaluation of Behaviours Towards Rational Drug Use in University Students

Üniversite Öğrencilerinde Akılcı İlaç Kullanımına Yönelik Davranışların Değerlendirilmesi

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Abstract

Background: Rational drug use is the use of drugs that meet patients' clinical needs, in doses appropriate to their individual requirements, for the correct duration and at the lowest cost. Irrational drug use poses significant health and economic problems. Due to various factors such as inability to apply healthcare institutions, financial difficulties, stress and exposure to social media and the internet, which encourage self-medication university students tend to engage in irrational drug use. This research seeks to investigate the behaviors associated with rational drug use among students enrolled in health and non-health disciplines at Gaziantep University.
Materials and Methods: A survey was conducted with 1638 students studying at Gaziantep University between January and June 2018. The survey form consisted of 53 questions that evaluated sociodemographic characteristics and behaviors related to rational drug use. The findings were compared and evaluated among all participants, student groups studying in the health and non-health fields and additionally, among student groups studying in the medical faculty and other health field faculties.
Results: The rate of non-prescription drug use among university students has been determined as 64.2%. The most frequently used non-prescription drug groups are analgesics (51.7%), cold drugs (12.5%), vitamins (6.4%) and antibiotics (5.4%). The frequency of non-prescription drug use is significantly higher among health field students compared to non-health field students and among medical students compared to other health field students ($p<0.05$). The use of drug based on the recommendation of acquaintances is significantly higher among non-health field students compared to health field students ($p<0.05$). Among all participants, the rate of non-prescription antibiotic use for flu or cold is 44.4%, with non-health field students using non-prescription antibiotics for flu/cold more frequently than health field students ($p<0.05$). More than half of the students use alternative products/treatments, with the most frequently used being nutritional supplements (33.5%) and herbal products (20.0%). Additionally, 20.2% of the students have been determined to use drug/products outside of drug to enhance exam performance during exam periods, with the most frequently used being methylphenidate (5.1%) and multivitamins (5%).
Conclusions: Irrational drug use behaviors are widely observed among university students, who are the architects of the future. Health field students act more rationally compared to non-health field students, especially in terms of antibiotic use. To enhance awareness of rational drug use, it is essential to carry out research and educational initiatives in collaboration with health authorities, universities, professional healthcare providers, and the media.

Keywords: Rational drug use, University students, Behaviour of drug use

Öz

Amaç: Akılcı ilaç kullanımı, hastaların klinik ihtiyaçlarını karşılayan ilaçları, bireysel gereksinimlerine uygun dozlarda, doğru süreyle ve en düşük maliyetle kullanmasıdır. İlaçların akılcı olmayan kullanımları sağlık ve ekonomi açısından önemli sorunlara yol açmaktadır. Üniversite öğrencileri çeşitli nedenlerle sağlık kuruluşlarına başvuramama, ekonomik sıkıntı, stres ve kendi kendine tedaviyi teşvik eden sosyal medya ve internet ortamına maruziyet gibi sebeplerle akılcı olmayan ilaç kullanımına yönelmektedir. Bu çalışmada, Gaziantep Üniversitesi'nde sağlık alanındaki ve sağlık alanı dışındaki fakültelerde eğitim alan öğrencilerin akılcı ilaç kullanımına yönelik davranışlarının incelenmesi amaçlanmıştır.
Materyal ve Metod: Gaziantep Üniversitesi'nde öğrenim gören 1638 öğrenciye 2018 yılının Ocak ve Haziran ayları arasında anket yapılmıştır. Anket formu, öğrencilerin sosyodemografik bilgilerini ve akılcı ilaç kullanımı ile ilgili davranışlarını değerlendiren 53 soruyu kapsamaktadır. Bulgular tüm katılımcılarda, sağlık alanında ve sağlık alanı dışında öğrenim gören öğrenci gruplarında ve ayrıca, tıp fakültesi ile tıp fakültesi dışındaki sağlık alanı fakültelerinde eğitim almakta olan öğrenci gruplarında karşılaştırılarak değerlendirilmiştir.
Bulgular: Üniversite öğrencileri arasında reçetesiz ilaç kullanım oranı %64.2, reçetesiz en sık kullanılan ilaç grupları analjezikler (%51.7), soğuk algınlığı ilaçları (%12.5), vitaminler (%6.4) ve antibiyotikler (%5.4) olarak belirlenmiştir. Reçetesiz ilaç kullanım sıklığı, sağlık alanı öğrencileri arasında sağlık alanı dışındakilere göre ve tıp fakültesi öğrencilerinde diğer sağlık alanı öğrencilerine oranla anlamlı olarak daha yüksektir ($p<0.05$). Tanıdık tavsiyesi ile ilaç kullanımı sağlık alanı dışı öğrencilerinde sağlık alanı öğrencilerine oranla daha yüksektir ($p<0.05$). Tüm katılımcılarda grip ya da soğuk algınlığında reçetesiz antibiyotik kullanımı %44.4 oranında olup sağlık alanı dışı öğrencileri sağlık alanı öğrencilerine göre daha sık grip/soğuk algınlığında reçetesiz antibiyotik kullanmaktadır ($p<0.05$). Öğrencilerin yarısından fazlası alternatif ürün/tedavi kullanmakta ve en sık besin destekleri (% 33.5) ve bitkisel ürünler (% 20.0) kullanılmaktadır. Ayrıca, öğrencilerin %20.2'sinin sınav dönemlerinde sınav performansını arttırmak amacıyla ilaç/ilaç dışı ürün kullandığı ve bu amaçla en sık metilfenidat (% 5.1) ve multivitaminlerin (% 5) kullanıldığı belirlenmiştir.
Sonuç: Geleceğin mimarı olan üniversite öğrencileri arasında akılcı olmayan ilaç kullanımı davranışları yaygın bir şekilde gözlenmektedir. Sağlık alanı öğrencileri sağlık alanı dışı öğrencilere göre özellikle antibiyotik kullanımı olmak üzere daha rasyonel davranmaktadır. Akılcı ilaç kullanımı farkındalığının arttırılabilmesi amacıyla sağlık otoritelerinin, üniversitelerin, profesyonel sağlık çalışanlarının ve medyanın iş birliği ile akılcı ilaç kullanımına yönelik araştırmaların ve eğitimlerin yapılması önem taşımaktadır.

Anahtar Kelimeler: Akılcı ilaç kullanımı, Üniversite öğrencileri, Ilaç kullanım davranışı

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Introduction

Rational drug use is defined as the use of drugs appropriate for the clinical needs of patients in doses that meet their individual requirements, in sufficient time, at the lowest cost to themselves and the society (1).

Rational drug use involves several key steps: making the correct diagnosis, determining treatment goals and treatment options, choosing the suitable treatment, correctly prescribing drug if drug therapy is warranted, initiating treatment by providing clear information and instructions to the patient, evaluating the prognosis and monitoring and assessing treatment outcomes. Throughout the process of rational drug use, it is critical to consider non-pharmacological treatment options, conduct a comprehensive analysis of drugs in terms of efficacy, appropriateness, safety and cost, minimize potential risks, inform the patient and ensure their participation in the treatment process (2, 3).

Globally, more than half of all medicines are prescribed, dispensed or sold inappropriately, half of the patients do not use their drugs correctly and one-third of the world's population lacks access to essential medicines (4).

Rational drug use plays a fundamental role in preventing polypharmacy, inappropriate self-medication, non-adherence to treatment, inappropriate prescribing according to clinical guidelines, prolonged disease duration, antibiotic resistance, drug-drug interactions, adverse events and increased treatment costs (5).

University students tend to use drugs irrationally due to factors such as financial difficulties, inability to access healthcare facilities for various reasons, stress and exposure to social media and the internet which promote self-medication (6, 7). Since university students represent a significant social group that constitue the country's future, improving their awareness and behaviors regarding rational drug use can significantly contribute to the sustainable development of society. This research seeks to identify the behaviors related to rational drug use among university students enrolled in health and non-health fields at Gaziantep University.

Materials and Methods

The population for this cross-sectional descriptive study includes 25,204 students enrolled in various faculties at Gaziantep University, specifically in Medicine, Arts and Sciences, Dentistry, Law, Fine Arts, Engineering, Theology, and Economics and Administrative Sciences, as well as in the Nursing and Midwifery Departments of the Faculty of Health Sciences, the School of Physical Education and Sports, and the Vocational School of Health Services, during the period from January to June 2018. With a precision of 5% and a confidence level of 95%, the minimum number of participants required to estimate a prevalence of 50% has been calculated to be 379.

The researchers prepared a questionnaire based on relevant literature (6, 8-10), which was then administered through face-to-face interviews with 1,638 students who consented to participate in the study from January 20 to June 20, 2018. The questionnaire comprises 53 questions that evaluate the sociodemographic characteristics of the participants and their behaviors related to rational drug use. The data were analyzed using descriptive statistics and the Chi-square test through the SPSS 26 for Windows software package. A p-value of less than 0.05 was considered statistically significant. Ethical approval for the study was obtained from the Gaziantep University Clinical Research Ethics Committee, with decision number 38, dated 18 January 2018.

Results

A total of 1,638 students took part in the study, with 722 (44.1%) enrolled in healthcare-related faculties and 916 (55.9%) in non-healthcare-related faculties. 357 (49.4%) of the health field students are studying at the faculty of medicine. Of all participants, 56.8% are female, 57% are 21 years old or younger, 45.4% are in good economic condition, 87.1% have health insurance, 23% smoke, 22.4% use alcohol and 92% do not have any chronic diseases (Table 1).

The students' behaviors regarding drug procurement are shown in Table 2 and the procured drug groups are illustrated in Figure 1, which includes only the primarily marked drug groups. 64.2% of participants use non-prescription drugs, with the most frequently procured being painkillers (51.7%), cold drugs (12.5%), vitamins (6.4%), and antibiotics (5.4%). Health field students (70.5%) use non-prescription drugs significantly more than non-health field students (59.2%) and procure painkillers, cold drugs, vitamins, and gastrointestinal system drugs without a prescription at a higher rate ($p<0.05$). 50.8% of students use drugs with the advice of relatives or friends, with painkillers (42.7%) being the most frequently used, followed by cold drugs (9.5%) and antibiotics (6.7%). Non-health field students (53.8%) use drugs with advice from acquaintances significantly more than health field students ($p<0.05$). Painkillers are more frequently used in the non-health field group, while vitamins and allergy drugs are used more often in the health field group ($p<0.05$). Participants recommend drugs to acquaintances at a rate of 54.9%, with the most recommended being analgesics (43.2%), cold drugs (18.4%) and antibiotics (10.1%). Health field students (59.4%) recommend drugs significantly more often than non-health field students (51.3%) and they recommend painkillers, antibiotics, cold drugs and vitamins at a higher rate ($p<0.05$). It was found that 63.9% of participants obtained a prescription or purchased drugs without being ill, thinking they might need them, with the most commonly obtained drugs being analgesics (50.7%), cold drugs (21.4%), stomach drugs (21.4%), antibiotics (16.1%), vitamins (16.1%) and psychiatric drugs (8.7%).

Table 1. Sociodemographic characteristics of university students.

Demographic characteristics	Total (1638), n (%)	Health field (722) n (%)	Non-health field (916) n (%)
Gender			
Woman	930 (56.8)	445 (61.6)	485 (52.9)
Male	708 (43.2)	277 (38.4)	431 (47.1)
Age			
21 years and younger	934 (57)	423 (58.6)	511 (55.8)
22 years and older	704 (43)	299 (41.4)	405 (44.2)
Economic situation			
Poor	562 (34.3)	177 (24.5)	385 (42)
Moderate	332 (20.3)	139 (19.3)	193 (21.1)
Good	744 (45.4)	406 (56.2)	338 (36.9)
Health insurance			
Avaliable	1426 (87.1)	668 (92.5)	758 (82.8)
Not avaliable	212 (12.9)	54 (7.5)	158 (17.2)
Smoking status			
Smoker	376 (23)	138 (19.1)	238 (26)
Nonsmoker	1262 (77)	584 (80.9)	678 (74)
Alcohol use			
Yes	367 (22.4)	178 (24.7)	189 (20.6)
No	1271 (77.6)	544 (75.3)	727 (79.4)
Presence of chronic disease			
Yes	131 (8)	60 (8.3)	71 (7.8)
No	1507 (92)	662 (91.7)	845 (92.2)

Table 2. Students' attitudes towards supplying drug.

	Total (1638) n (%)	Health field (722) n (%)	Non-health field (916) n (%)	P value
Use of non-prescription drug				
Yes	1051 (64.2)	509 (70.5)	542 (59.2)	χ^2=22.534, p= 0.001
No	587 (35.8)	213 (29.5)	374 (40.8)	
Use of drug on the recommendation of acquaintances				
Yes	832 (50.8)	339 (47)	493 (53.8)	χ^2=7.620. p= 0. 006
No	806 (49.2)	383 (53)	423 (46.2)	
Recommending drug to acquaintances				
Yes	899 (54.9)	429 (59.4)	470 (51.3)	χ^2=10.720, p= 0. 001
No	739 (45.1)	293 (40.6)	446 (48.7)	
Purchasing drug without being ill				
Yes	1046 (63.9)	455 (63)	591 (64.5)	χ^2=0.394, p= 0.530
No	592 (36.1)	267 (37)	325 (35.5)	

While there was no significant difference between health field students (63%) and non-health field students (64.5%) in this behavior (p>0.05), health field students more frequently procured cold drugs (p<0.05) (Table 2 and Figure 1).

Students' responses regarding antibiotic use are shown in Table 3. 44.4% of participants use antibiotics without a prescription for flu or cold, with this behavior observed more frequently in non-health field students (48.4%) than in health field students (39.3%) (p<0.05). The rate of quiting the prescribed antibiotics before finishing them was 81% among students and non-health field students (84.7) left the prescribed antibiotics before finishing them at a higher rate than health field students (76.2) (p<0.05). The most common reason for stopping antibiotics before finishing them was recovery (32.4%). This reason was more prevalent among non-health field students, while forgetfulness was a more frequent cause for discontinuation among health field students. (p<0.05) (Table 3).

Table 4 presents students' behaviors related to drug use. Among them, 85.4% reported receiving information from a doctor/pharmacist about the prescribed drug, 65.4% had no issues obtaining drugs, 44% preferred the cheaper option among drugs with the same effect, 97.5% used their drugs as directed by doctor and 93.9% read the drug instructions. Health field students preferred cheaper drugs more often, while non-health field students more frequently had issues obtaining prescription drugs and asked for information from the doctor/pharmacist (p<0.05) (Table 4).

Table 3. Students' responses about the use of antibiotics.

	Total (1638) n (%)	**Health field (722) n (%)**	**Non-health field (916) n (%)**	**P value**
Use of non-prescription antibiotics for flu or cold				
Yes	727 (44.4)	284 (39.3)	443 (48.4)	χ^2=13.329, **p=0.001**
No	911 (55.6)	438 (60.7)	473 (51.6)	
The situation of stopping a prescribed antibiotic before finishing it.				
Yes	1326 (81)	550 (76.2)	776 (84.7)	χ^2=19.092, **p=0.001**
No	312 (19)	172 (23.8)	140 (15.3)	
The reason for stopping a prescribed antibiotic before finishing it*				
Recovery	618 (37.7)	242 (32.4)	376 (41)	χ^2=9.744, **p=0.002**
Feeling well	464 (28.3)	203 (26.3)	261 (27.5)	χ^2=0.028, p=0.866
Forgetfulness	129 (7.9)	76 (10.5)	53 (5.8)	χ^2=12.505, **p=0.001**
Allergy	25 (1.5)	8 (1.1)	17 (1.9)	χ^2=1.503, p=0.220
Aiming to avoid excessive drug use	147 (9.0)	67 (9.3)	80 (8.7)	χ^2=0,147, p=0,701
Other	31 (1,9)	11 (1.5)	20 (2.2)	χ^2=0.947, p=0,331

**More than one answer was given.*

Table 4. Students' behaviors related to drug use.

	Total (1638) n (%)	**Health field (722) n (%)**	**Non-health field (916) n (%)**	**P value**
The situation of using the drug as directed by the doctor/pharmacist				
Yes	1597 (97.5)	710 (98.3)	803 (87.7)	χ^2=3,742. p=0. 053
No	41 (2.5)	12 (1.7)	113 (12.3)	
The situation of paying attention to taking the drug on an empty/full stomach				
Yes	1611 (98.4)	715 (99)	896 (97.8)	χ^2=3.670, p=0. 055
No	27 (1.6)	7 (1)	20 (2.2)	
The situation of paying attention to taking the drug on time				
Yes	1517 (92.6)	675 (93.5)	842 (91.9)	χ^2=1.453, p=0. 228
No	121 (7.4)	47 (6.5)	74 (8.1)	
The situation of paying attention to the drug dosage				
Yes	1591(97.1)	709 (98.2)	882 (96.3)	χ^2=5.292, p=0.021
No	47 (2.9)	13 (1.8)	34 (3.7)	
The situation of paying attention to the use of the drug with other drugs				
Yes	1523 (93)	673 (93.2)	850(92.8)	χ^2=0. 108, p=0. 742
No	115 (7)	49 (6.8)	66 (7.2)	
The situation of preferring the cheaper option among drugs with the same effect				
Yes	720 (44)	384 (53.2)	336 (36.7)	χ^2=44.645, **p=0.001**
No	918 (56)	338 (46.8)	580 (63.3)	
The situation of experiencing problems in obtaining prescription drugs				
Yes	567 (34.6)	221 (30.6)	346 (37.8)	χ^2=9.154, **p=0. 002**
No	1071 (65.4)	501 (69.4)	570 (62.2)	
The situation of asking the doctor/pharmacist for information about the drug				
Yes	1399 (85.4)	596 (82.5)	803 (87.7)	χ^2=8.478, **p=0. 004**
No	239 (14.6)	126 (17.5)	113 (12.3)	
The situation of reading the drug instructions				
Yes	1538 (93.9)	687 (95.2)	851 (92.9)	χ^2=3.561, p=0. 059
No	100 (6.1)	35 (4.8)	65 (7.1)	

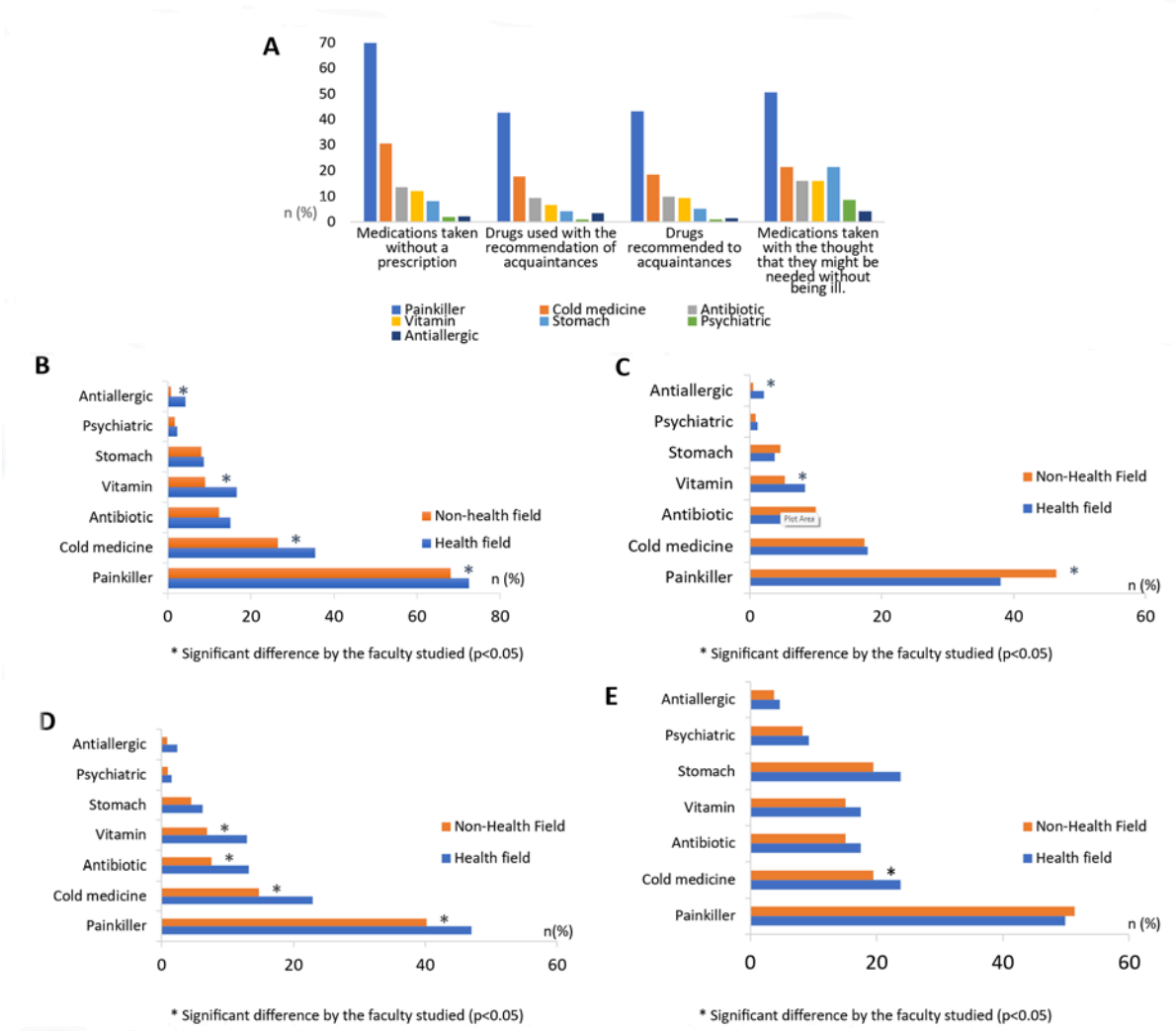

Figure 1. A. Students' behaviors in supplying drug. B. Distribution of non-prescription drug groups according to the type of faculty. C. Distribution of drug groups taken based on the recommendation of acquaintance according to the type of faculty. D. Distribution of drug groups recommended to acquaintance according to the type of faculty. E. Distribution of drug groups prescribed/purchased with the thought that they may be needed without being ill according to the type of faculty. Multiple responses have been given to all questions related to drug groups.

The responses of students regarding the occurrence of side effects, the lack of benefit from the drug, storage conditions of drugs and the status of unused drugs are presented in Table 5. Students most frequently reported consulting a doctor (41.3%) when they experienced any side effects from the drugs they used and they most commonly stopped using the drug (41%) when they did not benefit from it. Students most frequently stored drugs at room temperature (62%) and in the refrigerator (33%), and least frequently according to the temperature conditions specified in the usage instructions/package (4.9%). Of the participants, 64.2% disposed of expired unused drugs, 25.9% left them at home, 6.8% gave them to a hospital/health center/pharmacy and 3.1% gave them to someone in need. Non-health field students (45.9%) reported stopping the drug when they did not benefit from it at a higher rate than health field students (34.9%) ($p<0.05$). Health field students (%30.9) more frequently reported leaving unused drugs at home compared to non-health field students (%21.9) ($p<0.05$)

The students' use of alternative products/treatments and drug/products outside of drug to enhance exam performance is presented in Table 6. The frequency of using drug/products outside of drug to enhance exam performance was 20.2% overall, 21.2% among health field students and 19.4% among non-health field students, with no significant difference ($p>0.05$). Alternative product/treatment usage was 52.1% overall, 54.4% among health field students and 50.3% among non-health field students, also showing no significant relationship with faculty type ($p > 0.05$). The drug/products outside of drug used, in order of frequency, were methylphenidate (5.1%), multivitamins (5%), B vitamin complexes (4.4%), caffeine-containing energy drinks (2.7%), modafinil (1.6%), propranolol (1.0%), passiflora (0.7%), coenzyme Q10 (0.7%), and ginkgo biloba (0.3%). Alternative products/treatments included nutritional supplements (33.5%), herbal products (20.0%), cupping therapy (1.8%), acupuncture (1.6%), reflexology (1.5%), neural therapy (1.0%), mesotherapy (0.7%), and

hypnosis (0.2%). The types of alternative products/treatments and drug/products outside of drug differed significantly between health field and non-health field students ($p < 0.05$). Methylphenidate, multivitamins and energy drinks were more frequently used by health field students, while nutritional supplements and herbal treatments were more frequently used by non-health field students ($p<0.05$) (Figure 2).

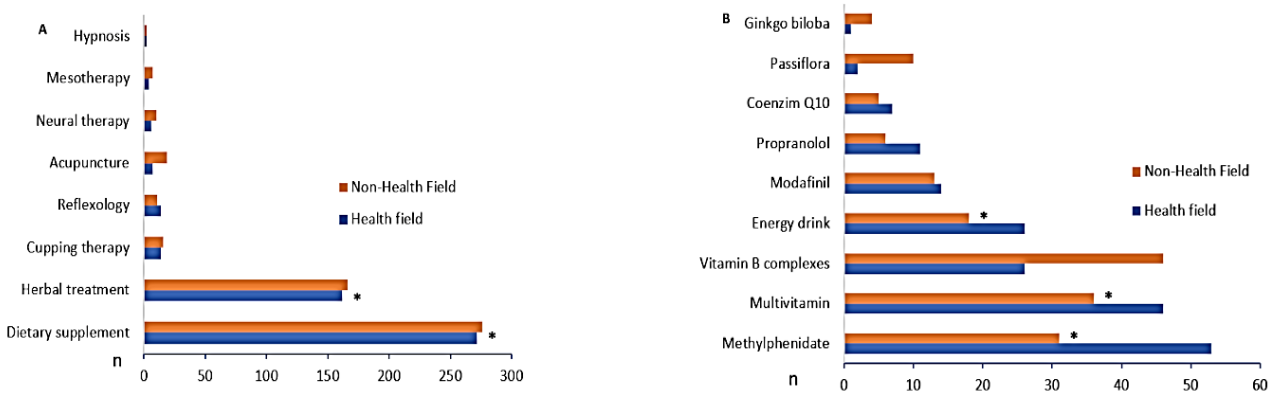

Figure 2. A. Comparison of alternative products/treatment types used by students between health and non-health students. B. Comparison of drugs/products used to increase exam success during the exam period between health and non-health students. In the questions regarding drugs/non-drug products and alternative products/treatment types, multiple responses were allowed.
*= p<0.05.

Table 5. Responses regarding the storage locations of drugs at home, the status of unused drugs and the situation of not benefiting from the drug.

	Total (1638) n (%)	**Health field (722) n (%)**	**Non-health field (916) n (%)**	**P value**
Responses regarding the situation of the drug causing side effects.				
I stop taking the drug	583 (35.6)	244 (33.8)	339 (37)	
I apply to the doctor	677 (41.3)	304 (42.1)	373 (40.7)	
I continue to use (the drug)	27 (1.7)	15 (2.1)	12 (1.3)	χ^2=3.032, p=0. 0552
I stop taking the drug and apply to the doctor	349 (21.3)	158 (21.9)	191 (20.9)	
Other	2 (0.1)	1 (0.1)	1 (0.1)	
Responses regarding the situation of not benefiting from the drug				
I stop taking the drug	672 (41)	252 (34.9)	420 (45.8)	
I apply to the doctor	577 (35.2)	277 (38.4)	300 (32.8)	χ^2=21.291, **p=0. 001**
I continue to use drug	106 (6.5)	52 (7.2)	54 (5.9)	
I stop taking the drug and apply to the doctor	282 (17.2)	140 (19.4)	142 (15.5)	
Other	1 (0.1)	1 (0.1)	0 (0.0)	
Storage locations of drugs at home				
Room temperature	1016 (62)	454 (62.9)	562 (61.4)	
In the refrigerator	541 (33)	231 (32)	310 (33.8)	χ^2=0.654. p=0. 721
According to the temperature specified in the instructions/packaging	81 (4.9)	37 (5.2)	44 (4.8)	
Responses regarding the status of unused drugs				
I throw it away if it has expired	1052 (64.2)	432 (59.8)	620 (67.7)	
It stays at home	424 (25.9)	223 (30.9)	201 (21.9)	χ^2=22.377, **p=0. 001**
I give it to the hospital/health clinic/pharmacy	111 (6.8)	39 (5.4)	72 (7.9)	
I give it to someone in need	51 (3.1)	28 (3.9)	23 (2.5)	

Table 6. Participants' use of drug/product outside of drug to enhance exam performance during exam periods and alternative products/treatments.

	Total (1638) n (%)	**Health field (722) n (%)**	**Non-health field (916) n (%)**	**P value**
Use of drug/product outside of drug to enhance exam performance during exam periods				
Yes	331 (20.2)	153 (21.2)	178 (19.4)	
No	1307 (79.8)	569 (78.8)	738 (80.6)	χ2=0.775, p=0.379
Use of alternative products/treatments				
Yes	854 (52.1)	393 (54.4)	461 (50.3)	
No	784 (47.9)	329(45.6)	455 (49.7)	χ2=2.726, p=0.099

Table 7 outlines the rational drug use behaviors of medical and non-medical health field students. Medical students reported significantly higher rates of using non-prescription drugs including analgesics, cold drugs, vitamins, stomach drugs and antihistamines compared to non-medical health field students ($p < 0.05$). However, the use of non-prescription antibiotics for flu and cold symptoms was significantly lower among medical students ($p < 0.05$). There was no significant difference between the two groups in the use of drug/products outside of drug to enhance exam performance ($p > 0.05$), although medical students reported using modafinil more frequently than non-medical health field students during exam periods ($p < 0.05$) (Table 7).

Table 8 compares certain behaviors related to rational drug use among students based on their sociodemographic characteristics. Behaviors such as getting a prescription/purchasing drug without being sick, choosing the cheaper option among drugs with the same effect, reading drug instructions and using drug/products outside of drug to enhance exam performance showed significant differences according to gender ($p<0.05$). Women more frequently get prescriptions or purchase drugs without being sick and read drug instructions, while men more often choose cheaper drugs with the same effect and use non-prescription drug/products outside of drug to enhance exam success ($p<0.05$). Individuals aged 22 and older obtain medicines without a prescription and use drug/products outside of drug for exam success more frequently than those aged 21 and younger ($p<0.05$). Economic status also showed significant differences: students with good economic status more often obtained non-prescription drugs and used drug/products outside of drug during exam periods, while those with poor economic status faced more difficulties in obtaining drugs ($p<0.05$). Participants without health insurance more frequently used non-prescription antibiotics for flu/cold and had more difficulties obtaining drugs compared to those with insurance ($p<0.05$). Those with chronic diseases showed significantly higher usage of alternative products/treatments than those without such conditions ($p<0.05$) (Table 8).

Table 7. Comparison of certain behaviors related to rational drug use between medical students and students from non-medical health fields.

	Medical students (n=357), n %	**Non-medical health field students (n=365), n %**	**P value**
Those who take medicine without a prescription	276 (77.3)	233 (63.8)	χ^2=15.757 **p=0.001**
Medicines taken without a prescription**			
Pain killers	223 (62.5)	192 (52.6)	χ^2=7.182 p=**0.007**
Antibiotic	22 (6.2)	18 (4.9)	χ^2=0.523 p=0.470
Cold drug	85 (23.8)	27 (7.4)	χ^2=37.093 p=**0.001**
Vitamin	68 (19.0)	4 (1.1)	χ^2=64.784 p=**0.001**
Stomach drug	24 (6.7)	3 (0.8)	χ^2=17.457 p=**0.001**
Psychiatric drug	7 (2.0)	3 (0.8)	χ^2=1.714 p=0.190
Allergy drug	25 (7.0)	13 (3.6)	χ^2=4.286 p=**0.038**
Those who prescribed/purchase medicine without being ill	230 (64.4)	225 (61.6)	χ^2=0.599 p=0.439
Those who prefer cheaper alternatives with the same effect	204 (57.1)	180 (49.3)	χ^2=4.441 p=0.097
Those who had problems obtaining prescribed drug	99 (27.7)	122 (33.4)	χ^2=2.754 p=**0.035**
Those who read the instructions before using the drug	338 (94.7)	349 (95.6)	χ^2=0.345 p=0.557
Those who use non-prescription antibiotics for cold/flu	118 (33.1)	166 (45.5)	χ^2=11.678 p=**0.001**
Those who use alternative products/treatments	203 (56.9)	189 (51.8)	χ^2=1.878 p=0.171
Those who use medicine/products to enhance exam performance	82 (23.0)	71 (19.5)	χ^2=1.337 p=0.248
Medicines/products used to enhance exam performance**			
Methylphenidate	31 (8.7)	22 (6.0)	χ^2=1.872 p=0.171
Multivitamins	31 (8.7)	15 (4.1)	χ^2=6.329 p=0.012
Vitamin B complex	17 (4.8)	9 (2.5)	χ^2=2.741 p=0.098
Energy drink	11 (3.1)	15 (4.1)	χ^2=0.550 p=0.458
Modafinil	12 (3.4)	2 (0.5)	χ^2=7.513 p=**0.006**
Propranolol	7 (2.0)	4 (1.1)	χ^2=0.900 p=0.343
Passiflora	0 (0.0)	2 (0.5)	χ^2=1.962 p=0.161
Coenzyme Q10	4 (1.1)	3 (0.8)	χ^2=0.168 p=0.722*
Ginkgo biloba	1 (0.3)	0 (0.0)	χ^2=0.168 p=0.494*

** Fischer exact test has been used.*

***More than one answer was given.*

Table 8. Comparison of Students' Behaviors Towards Rational Drug Use According to Their Sociodemographic Characteristics.

Demographic characteristics	Those who take drug without a prescription	Those who purchase drug without being ill	Those who prefer cheaper drug	Those who had problems obtaining drug	Those who read the instructions	Those who use non-prescription antibiotics for cold/flu	Those who use alternative products	Those who use drug/product to enhance exam performance
Gender								
Female	597 (64.2)	630 (67.7)	382 (40.1)	299 (32.1)	889 (95.6)	407 (43.8)	494 (52.8)	172 (18.5)
Male	454 (64.1)	416 (58.8)	358 (47.8)	268 (37.8)	649 (91.7)	320 (45.2)	363 (51.3)	159 (22.5)
Test	χ^2=0.001 p=0.977	χ^2=14.06 **p=0.001**	χ^2=7.274 **p=0.026**	χ^2=5.827 p=0.054	χ^2=10.802 **p=0.001**	χ^2=0.335 p=0.563	χ^2=0.374 p=0.541	χ^2=3.915 **p=0.048**
Age								
≤21	573 (61.3)	600 (64.2)	392 (42.0)	309 (33.1)	875 (93.7)	430 (46.0)	477 (51.1)	169 (18.1)
≥22	478 (67.9)	446 (63.4)	328 (46.6)	258 (36.6)	663 (94.2)	297 (42.2)	377 (53.6)	162 (23.0)
Test	χ^2=7.487 **p=0.006**	χ^2=1.37 p=0.711	χ^2=3.479 p=0.062	χ^2=2.253 p=0.133	χ^2=0.170 p=0.680	χ^2=2.412 p=0.120	χ^2=0.990 p=0.320	χ^2=6.019 **p=0.014**
Economic Status								
Poor	316 (56.2)	349 (62.1)	240 (42.7)	221 (39.3)	525 (93.4)	284 (50.5)	282 (50.2)	103 (18.3)
Moderate	214 (64.5)	223 (67.2)	146 (44.0)	130 (39.2)	319 (96.1)	143 (43.1)	178 (53.6)	55 (16.6)
Good	521 (70.0)	474 (63.7)	334 (44.9)	216 (29.0)	694 (93.3)	300 (40.3)	394 (53.0)	173 (23.3)
Test	χ^2=26.529 **p=0.001**	χ^2=2.337 p=0.311	χ^2=0.622 p=0.733	χ^2=18.77 **p=0.001**	χ^2=3.492 p=0.174	χ^2=13.814 p=0.001	χ^2=1.355 p=0.508	χ^2=8.241 **p=0.016**
Health Insurance								
Yes	914 (64.1)	912 (64.0)	617 (43.3)	462 (32.4)	1347 (94.5)	617 (43.3)	743 (52.1)	285 (20.0)
No	137 (64.6)	134 (63.2)	103 (48.6)	105 (49.5)	191 (90.1)	110 (44.1)	111 (52.4)	46 (21.7)
Test	χ^2=0.022 p=0.881	χ^2=0.045 p=0.833	χ^2=2.118 p=0.146	χ^2=23.92 **p=0.001**	χ^2=6.136 p=**0.013**	χ^2=5.554 **p=0.018**	χ^2=1.355 p=0.508	χ^2=0.336 p=0.562
Chronic Illness								
Yes	92 (70.2)	83 (63.4)	59 (45.0)	55 (42.0)	125 (95.4)	55 (42.0)	80 (68.3)	35 (26.7)
No	959 (63.3)	963 (63.9)	661 (43.9)	512 (34.0)	1413 (93.8)	672 (44.6)	774 (51.4)	296 (19.6)
Test	χ^2=2.278 p=0.131	χ^2=0.015 p=0.901	χ^2=0.068 p=0.795	χ^2=3.417 p=0.065	χ^2=0.578 p=0.447	χ^2=0.332 p=0.565	χ^2=4.552 **p=0.033**	χ^2=3.742 p=0.053
Smoking								
Yes	242 (64.4)	256 (68.1)	170 (45.2)	138 (36.7)	338 (89.9)	167 (44.4)	185 (53.0)	104 (27.7)
No	809 (64.1)	790 (62.6)	550 (43.6)	429 (34.0)	1200 (95.1)	560 (44.4)	669 (53.0)	227 (18.0)
Test	χ^2=0.008 p=0.927	χ^2=3.778 p=0.052	χ^2=0.313 p=0.576	χ^2=0.939 p=0.333	χ^2=13.631 **p=0.001**	χ^2=0.001 p=0.989	χ^2=1.684 p=0.194	χ^2=16.808 **p=0.001**
Alcohol use								
Yes	269 (73.3)	249 (67.8)	196 (46.0)	137 (37.3)	338 (92.1)	172 (46.9)	189 (51.5)	110 (30.0)
No	782 (61.5)	797 (62.7)	551 (43.4)	430 (33.8)	1200 (94.4)	555 (43.7)	665 (52.3)	221 (17.4)
Test	χ^2=17.159 **p=0.001**	χ^2=3,261 p=0.071	χ^2=0.841 p=0.359	χ^2=1.540 p=0.215	χ^2=2.664 p=0.103	χ^2=1.181 p=0.576	χ^2=0.077 p=0.277	χ^2=27.972 **p=0.001**

Discussion

Significant progress in rational drug use has been achieved in our country through awareness-raising activities conducted under the National Rational Drug Use Action Plan. Universities, health professionals and the pharmaceutical industry have also contributed to the efforts of health authorities in raising awareness of rational drug use in society. In our study, a questionnaire consisting of questions related to drug use is applied to 1,638 students studying in health field and non-health field faculties at Gaziantep University, aiming to determine the contributions of ongoing efforts to enhance awareness regarding rational drug use in our country and to identify and compare the rational drug use behaviors of students in health field and non-health field education.

In this research, the rate of non-prescription drug use among university students is 64.2%. In studies involving university students studying in health field and non-health field in our country, the rate of non-prescription drug use is reported as 23.2% in Erzincan and 35.4% in Istanbul (11, 12). In these studies, the frequency of non-prescription drug use has been determined to be lower compared to our study. This difference may be due to the varying regions where the research was conducted. Additionally, since the specified studies inquire about non-prescription drug use over a certain period, specifically in the last month, this one-month period may not allow for the evaluation of non-prescription drug use as a habit. The prevalence of self-medication among university students worldwide is reported to be 70.1% (13). This finding is higher than the frequency rate of non-prescription drug use obtained in our study. The behav-

ior of non-prescription drug use may vary depending on socioeconomic characteristics, the type of faculty studied, the drug legislation in the countries where the studies are conducted or the effectiveness of the authorities responsible for regulating the pharmaceutical market. The frequency of non-prescription drug use among university students determined in our study is similar to the results of other studies in the literature (14-16). Moreover, in a study conducted at the national level in our country in 2016, it was shown that the frequency of non-prescription drug use in the general population (80.48%) was higher than the rate we determined (17). The education that university students receive may contribute to the development of rational drug use behaviors.

In our study, participants were categorized into two age groups: 21 years and under and 22 years and over. The frequency of non-prescription drug use was significantly higher among those aged 22 years and over compared to those 21 years and under ($p<0.05$). In the study conducted by Osemene et al.(18), it has been determined that the frequency of self-medication among students shows a significant difference according to age, consistent with the findings we obtained. However, in some studies evaluating university students, the frequency of non-prescription drug use has not been associated with age (19, 20).

The frequency of non-prescription drug use in our study was higher among health field students (70.5%) compared to non-health field students (59.2%) ($p < 0.05$). Additionally, medical students (77.3%) used non-prescription drugs more frequently than non-medical health field students (63.8%) ($p < 0.05$). Similar findings were reported by Sharma et al. (21) and Klemenc-Ketis et al.(22) who found a higher frequency of self-medication among students in the health field. In contrast, Rahimisadegh et al. (23) found no significant difference between medical and non-medical students while Sawalha et al. (24) reported that self-medication was more common among students outside the health field. The higher frequency of non-prescription drug use among students in health field faculties can be attributed to their access to more information about diseases and drugs in their curriculum, leading to greater self-confidence.

In our study, analgesics were the most frequently used non-prescription drugs (51.7%), which aligns with previous research (25-27). Additionally, the Drug Surveillance Report-6 published by the Turkish Medicines and Medical Devices Agency (TITCK) in 2018 stated that, consistent with our findings, analgesics were the most frequently sold group of non-prescription drugs, accounting for 37.55% (28). This may be due to analgesics affordability, ease of access and perception of having fewer side effects. After analgesics, the most commonly used non-prescription drug categories were cold medicines (12.5%), vitamins (6.4%) and antibiotics (5.4%). In studies examining rational drug use among university students in our country, it has been reported that the frequency of non-prescription antibiotic use has gradually decreased over the years (11, 29, 30). This situation indicates that the prohibition of non-prescription antibiotic sales in pharmacies and the efforts to increase rational antibiotic use in the community, conducted within the framework of the Rational Drug Use Action Plan 2014-2017 by the Ministry of Health, have been effective (31).

We also found that non-prescription drug categories varied by field of study, with health field students more frequently obtaining analgesics, cold medicines, vitamins and stomach drugs without a prescription compared to non-health field students ($p<0.05$). However, there was no significant difference between the groups regarding the frequency of use of psychiatric and antiallergic drugs without a prescription. This finding we obtained is consistent with other studies in the literature which reported that the groups of medicines taken without prescription differed between students studying in health and non-health fields. It was reported that health field students used analgesics, antibiotics, antiallergic drugs, herbal products and laxatives more frequently and cold medicines and decongestants less frequently in self-medication compared to non-health field students (24, 32, 33).

In our study, the use of drugs based on family/friend/acquaintance advice has been associated with the type of faculty studied and it has been determined that the use of drugs based on acquaintance advice is higher among non-health field students compared to health field students ($p<0.05$). Alshogran et al. (33) similarly found that non-medical students were more likely to follow friends' recommendations for self-medication. While health field students were less likely to use drugs recommended by acquaintances, they were more likely to recommend drugs to others ($p<0.05$). This situation may stem from the thought that health field students have a sufficient level of medical knowledge due to their education.

In our study, the rate of non-prescription antibiotic use among students for flu or cold is 44.4%, observed more frequently among non-health field students (48.4%) than health field students (39.3%) ($p<0.05$). Additionally, non-medical health field students (45.5%) use non-prescription antibiotics for flu/cold at a higher rate than medical students (33.1%) ($p<0.05$). The rate of quitting prescribed antibiotics before finishing them is 81%, more frequent among non-health field students (84.7%) than health field students (76.2%) ($p<0.05$). The inappropriate prescribing of antibiotics, their use in inappropriate dosages, their use in the treatment of non-bacterial infections, self-medication and their excessive use lead to an increase in antibiotic resistance, which is defined as a global health problem and the spread of antibiotic resistance, limiting the effectiveness of treatments for infectious diseases (34-36). Literature examination reveals that, parallel to our findings, Shahpawee et al. (37) reported that 41% of students deemed antibiotic use appropriate for treating viral diseases like flu and colds, while Şahin et al. (32) found that non-health field students used non-prescription antibiotics for flu and cold more fre-

quently than health field students. Identifying antibiotic usage behaviors among university students can serve as an effective means to encourage rational antibiotic practices and mitigate antibiotic resistance. In our study, the frequency of non-prescription antibiotic use for flu and cold among university students is high, indicating a need for education and initiatives to raise awareness about rational antibiotic use. The high rate of discontinuation of antibiotic treatment in our study indicates that compliance with treatment, especially antibiotic treatment, is not achieved in university students.

In our study, we found that 34.6% of the students had problems in obtaining prescribed drug, those with poor (39.3) and moderate (39.2) economic status had significantly more problems in obtaining drug than those with good (29) economic status and those without health insurance (49.5) had significantly more problems in obtaining drug than those with (32.4) ($p<0.05$). Özyiğit et al. (29) reported in their 2015 study that 15% of students experienced problems in obtaining drugs. With the Health Transformation Program implemented in 2003 in our country, different health insurances were unified under one umbrella and their coverage was expanded, improving access to healthcare services. A positive relationship has been identified between having health insurance and the use of prescribed drugs, while individuals with poor economic conditions are more likely to use drugs without a prescription instead of with one (17).The finding from our study that 34.6% of students, particularly those without health insurance and those with poor economic status, experience problems in obtaining drugs may increase irrational drug use behaviors, such as non-prescription drug use and self-medication with antibiotics.

We determined that the behaviour of preferring the cheaper one among the drugs with the same effects was observed in 44% of university students and was significantly associated with gender and the type of faculty ($p<0.05$), whereas it was not associated with the presence of health insurance ($p<0.05$). We found that males preferred cheaper alternatives more frequently than females (47.8% vs. 40.1%, respectively) and students in the health field made this choice more often than those in the non-health field (53.2% vs. 36.7%, respectively) ($p<0.05$). In a study by Kukula (38) involving 640 medical faculty students, the rate of preferring cheaper drugs among those with the same effects was reported to be 31.88%. Generic drug use is a practice that can reduce the cost of treatment. As shown in our study, while it is pleasing that health field students prefer cheaper alternatives from drugs with the same effects, 56% of all students not choosing these options indicates a need for further research to increase awareness regarding generic drug practices.

In our study, the rate of students reading medication instructions was 93.9%. Women (95.6%) read instructions more than men (91.7%) ($p<0.05$). Consistent with our findings, Kurt et al. (39) reported that 56.5% of university students read instructions, while 27.7% did so sometimes. Moreover Taş (40) found that 84.2% of students read the medication leaflet. Alshogran et al. (33) associated the reading of instructions with the type of faculty studied, but our study did not find such a relationship.

The frequency of alternative product use in our study was 52.1%, with nutritional supplements (33.5%) and herbal products (20.0%) being the most commonly used. Consistent with our study, the literature indicates that the use of alternative products/treatments is prevalent among university students, with nutritional supplements and herbal products being among the most commonly utilized types of alternative treatments/products (41). These products are marketed as harmless through labels such as natural and herbal and are readily available for purchase online. However, there are numerous case reports of severe side effects associated with these products (42). Therefore, it is important that students are specifically informed about the use of alternative product/ treatments in rational drug use education programs.

We found that 20.2% of the students used drugs/product outside of drug to enhance exam performance during exam periods, with the most commonly used being methylphenidate (5.1%), multivitamins (5%), B vitamin complexes (4.4%), high-caffeine energy drinks (2.7%), and modafinil (1.6%). While the use of such products did not vary by field of study, health field students used methylphenidate, multivitamins and energy drinks more frequently than non-health field students and medical students used modafinil more often than other health field students ($p<0.05$). A study in France with medical students and physicians found a 33% prevalence of psychostimulant use to enhance academic performance, including vitamin C, caffeine-containing supplements, prescription, and illicit psychostimulants (43). In a study with 1,056 students in our country, only prescription psychostimulants, such as methylphenidate and modafinil, were assessed, with a reported prevalence of 8.4% (44) The frequency of using drugs/product to enhance academic performance may vary based on participant profiles, evaluated substances and the country of the study. Although central nervous system stimulant drugs are safe and effective within their indications, the undesirable effects associated with their non-medical use are not known. Therefore, it is necessary to increase efforts to detect the use of drugs without proper knowledge of their safety, incorrect duration of use and use without indication as well as to prevent such irrational drug use behaviors. The data from our study showing that the frequency of using drug/products outside of drug to enhance exam performance was significantly higher in males than in females ($p<0.05$) aligns with the literature (45). This higher frequency in males may be due to their greater tendency for risk-taking. We also found that students who use alcohol and tobacco were more likely to use drugs to enhance exam performance ($p<0.05$). This supports Şekerci et al. (44) which indicated that psychostimulant use was more prevalent among university students who consume alcohol and tobacco.

Compared to previous studies evaluating rational drug use among university students in Turkey, this study has the characteristic of being the study with the largest sample size to our knowledge. Previous studies on rational drug use in Turkey have mainly focused on students studying in the field of health. In our study, data on the rational drug use behaviours of students studying both in and out of the health field were presented. The main limitation of our study is that it was conducted solely on the selected sample.

In conclusion, our study found that irrational drug use behaviors were prevalent among university students. It has been demonstrated that students in the health field exhibit more rational behaviors, particularly regarding antibiotic use, compared to students in non-health fields. To increase awareness of rational drug use, it is essential to provide trainings on rational drug use in cooperation with health authorities, universities, healthcare professionals and the media.

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Author Contributions:
Concept: Z.D., B.A., F.S.S., B.A.
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