To cite this article: 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.

Original Article

Evaluation of knowledge and behaviors of students in faculty of medicine towards rational drug use

Tıp fakültesi öğrencilerinin akılcı ilaç kullanımına yönelik bilgi ve davranışlarının değerlendirilmesi

Osman KUKULA*

Ondokuz Mayıs University Faculty of Medicine, Department of Pharmacology, Samsun/TURKEY

Abstract

Aim: The study was conducted to determine the knowledge, attitudes and behaviors of university students on rational drug use. In recent years, non-rational drug use has become a global problem.

Material and Methods: The developed questionnaire was applied to 640 medical school students, who agreed to participate in the study, with face-to-face interview technique. The questionnaire has items to question the knowledge, attitudes, behaviors of individuals regarding the rational drug use.

Results: Of the study group, 54.6% (n=350) uses medicines only prescribed by physicians, 87.5% (n=560) uses drugs in accordance with the prescription, and 27.5% (n=176) stated to store medications under appropriate conditions. Of the respondents, 16.0% (n=103) was taking antibiotics on their own on complaints such as influenza and common cold, 15.5% (n=101) was taking vitamin and mineral supplements every day regularly, and 57.5% (n=368) had never used vitamin-mineral supplements regularly.

Conclusion: Non-rational drug use leads to decrease in adherence to treatment, drug interactions, resistance to certain drugs, recurrence or prolongation of the diseases, increased frequency of adverse conditions and increased treatment costs for patients. Of the respondents, 27.66% stated that he/she did not waste any medication, but the remaining 72.34% was wasting drugs more or less. The 81.56% rate of "Yes" response to the question "Would you like to receive training on rational drug use?", despite the 19.22% "Yes" to the "Have you received training on rational drug use?" in our study suggests that there is a need for more education on rational drug use.

Keywords: rational drug use; knowledge; behavior

Corresponding author*: Osman Kukula, Ondokuz Mayıs University Faculty of Medicine, Department of Pharmacology, Samsun/TURKEY
E-mail: okukula@gmail.com
ORCID: 0000-0001-5503-2462
Received: 10.10.2018 Accepted : 19.11.2018
Doi: 10.18663/tjcl.469300

Volume 11 Number 3 p: 294-300

Öz

Amaç: Çalışma, üniversite öğrencilerinin akılcı ilaç kullanımı hakkındaki bilgi-tutum-davranışlarını belirlemek amacı ile yapıldı. Son yıllarda, rasyonel olmayan ilaç kullanımı küresel bir sorun haline gelmiştir.

Gereçler ve Yöntemler: Hazırlanan anket yüz-yüze görüşme tekniği ile çalışmaya katılmayı kabul eden 640 Tıp Fakültesi öğrencisinde uygulandı. Ankette kişilerin akılcı ilaç kullanımına yönelik bilgi-tutum-davranışlarını sorgulayan sorular yer aldı.

Bulgular: Çalışma grubunun %54.6'sı (n=350) sadece hekimin verdiği ilaçları, %87.5'u (n=560) re¬çeteye uygun kullandıkları, %27.5'i (n=176) ilaçları uygun koşullarda sakladıklarını bildirdi. Katılımcıların %16.0'ı (n= 103) grip, nezle, soğuk algınlığı gibi şikayetler üzerine muayene olmadan, kendi başına antibiyotik kullandıklarını, %15.7'si (n=101) her gün düzenli vitamin-mineral desteği kullandığını, %57.5'i (n=368) ise düzenli vitamin-mineral desteği hiç kullanmadıklarını bildirmişlerdir.

Sonuç: Akılcı olmayan ilaç kullanımı hastaların tedaviye uyuncunun azalmasına, ilaç etkileşimlerine, bazı ilaçlara karşı direnç gelişmesine, hastalıkların tekrarlamasına ya da uzamasına, advers olay görülme sıklığının artmasına, tedavi maliyetlerinin artmasına neden olur. %27,66 oranında kesim hiç ilaç atmadığını belirtmekte ancak kalan %72,34 gibi yüksek bir kesim az ya da çok ilaçları atmaktadır. Çalışmamızda bulunan eğitim sürecinde akılcı ilaç eğitim aldınız mı sorusuna verilen evet cevabının %19,22 olması ve akılcı ilaç konusunda eğitim almak ister misiniz sorusuna verilen evet cevabının %81,56 gibi yüksek çıkması akılcı ilaç eğitimlerinin daha sık yapılması gerektiğini ortaya koymaktadır.

Anahtar Kelimeler: akılcı ilaç kullanımı; bilgi; davranış

Introduction

As in the whole world, the use of wrong and unnecessary drugs in Turkey is a serious problem affecting public health [1,2]. Non-rational drug use leads to decrease in adherence to treatment, drug interactions, resistance to certain drugs, recurrence or prolongation of the diseases, increased frequency of adverse conditions and increased treatment costs for patients [3,4].

An appropriate drug for an indication can be selected rationally on the basis of efficacy, safety, appropriateness and cost criteria . Rational drug use, first, primarily looks after the public health interests of the community [3]. In order to ensure rational drug use, attention must be paid to the following: First, the problem of the patient must be identified, it must be correctly diagnosed by the physician [5]. In line with this, the definition of effective and safe treatment with or without medication, if appropriate, should be followed by the steps of selection of appropriate medications, the appropriate dose and duration of administration for each medication, and the appropriate prescribing [6,7]. At this stage, approved, current diagnostic and therapeutic guidelines should be utilized [8]. The drugs used, most recently used drugs, and the patient's allergic condition should be questioned and indicated by the patient [9,10]. The patient should be informed about how to use the drugs, in what dose, how often (2 times a day, 12 hours a day) and how long (how many days), and their storage conditions, and it should be ensured that these instructions are applied completely by the patient/patient's relatives [11]. Patient/patient's relatives should be informed about potential side-effects of the drug, and drug and food interactions [12]. This should also be questioned by the patient/patient's relatives [13,14]. Drugs should be stored as specified in the instructions for use [15]. It should not be forgotten that, under inappropriate storage conditions, the chemical structures of the drugs may be deteriorated, that is to say, they may lose their effectiveness or even cause undesirable effects and intoxication [16]. Drugs that should be stored in the refrigerator should never be stored in the icebox and frozen [17]. Pregnant or breastfeeding women, children, the elderly, patients with renal and hepatic failure, those with chronic illness, and those with drug allergy history should paid more attention about the use of drugs [18]. The medication should not be used by chewing, breaking, breaking in half or dissolving in water except by the advice of the physician or pharmacist [19]. Remember that not every drug is produced accordingly. Drugs should be stored in their packaging, protected from light and moisture, in places where children cannot reach [20]. Drugs should be used only for the period recommended by your physician. Drug use should not be discontinued, and dose changes should not be made without consulting the physician [21]. Care should be taken to avoid skipping a dose and to take the medicine as recommended by the physician [22]. Unconscious use of other products intended for treatment, such as non-pharmaceutical

food supplements and herbal products should be avoided [23]. Drug boxes that have been cut or opened must not be purchased, and expired drugs should never be used [24].

In this study, priority recommendations for rational drug use were investigated.

Material and Methods

This descriptive study was conducted at Ondokuzmayıs University in Samsun, Turkey, between September and December 2017. The developed questionnaire was applied to 640 medical school students, who agreed to participate in the study, with face-to-face interview technique. The questionnaire has 42 items to question the knowledge, attitudes and behaviors of individuals regarding the rational drug use. "Rational drug use" behavior is defined as the use of drugs in accordance with prescription, having no difficulty in drug availability, storing the drugs at appropriate conditions, choosing the inexpensive one among the drugs with the same effect, not using any medication other than the medicine prescribed by the physician, and using the drugs for periods specified by the physician. Approval of Ondokuzmayıs University Clinical Research Ethics Committee (no 2017/229) was obtained to conduct the study. In the evaluation of the data, the SPSS software and descriptive statistics were used.

Results

Of the study group, 54.69% (n=350) uses medicines only prescribed by physicians, 87.5% (n=560) uses drugs in accordance with the prescription, and 27.5% (n=176) stated to store medications under appropriate conditions. Of the respondents, 28.44% (n=182) was using a drug recommended by the physician until it runs out, 23.44% (n=150) was preferring an inexpensive drug with the same effect, 68.44% (n=438) had no difficulty in obtaining the drugs, 68.75% (n=440) was carrying out research on the drug to be used, and 70.78% (n=453) reported that the color, packaging and taste of the drug was important for use. Of the respondents, 73.44% (n=470) indicated to read the instructions for use before using the drug, and 73.59% (n=471) was performing research on the drugs to be used. Of the participants, 18.75% (n=120) had no training on rational drug use during their education in the Faculty of Medicine, and 68.59% (n=439) wants to receive training on rational drug use. Of them, 37.5% (n=240) stated that he/she learns information about the use of the drugs from the physician, and 70.31% (n=450) contacts a physician when confronted with the side-effects of the drug. Of the respondents, 16.09% (n=103) was taking antibiotics on their own on complaints such as influenza and common cold, 15.78% (n=101) was taking vitamin and mineral supplements every day regularly, and 57.5% (n=368) had never used vitamin-mineral supplements regularly (Figure 1).

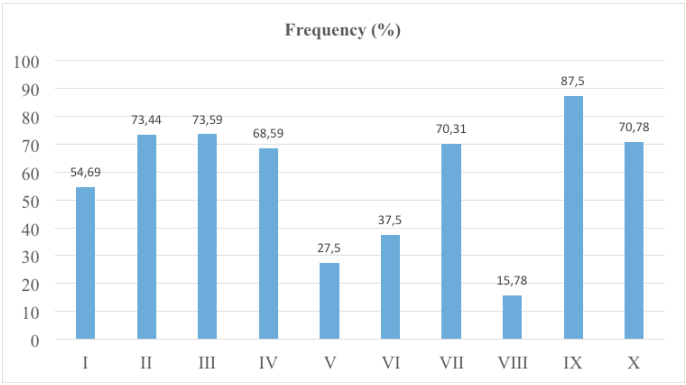

Figure 1. Answers to survey questions

I. Using only medicines given by the physician

II. Reading instructions for use before taking the medicine

III. Conducting research on the medicines that will be taken

IV. Asking to receive training on rational drug use

V. Storage of medicines under appropriate conditions

VI. Receiving the information from physicians regarding the use of the drug

VII. Contacting a physician when confronted with the side effects of the drug

VIII. Taking vitamin and mineral supplements every day regularly

IX. Usage according to the prescription

X. Importance of the color, packaging and taste of the drug for its use

Of the participants, 80.78% (n=517) had no training on rational drug use during their education, and 81.56% (n=522) wants to receive training on rational drug use (Table 1).

Table 1: Answers to survey questions

	Yes (%)	No (%)
Have you received training on the rational drug use during your education at the Faculty of Medicine?	19.22	80.78
Would you like to receive training on rational drug use?	81.56	18.44

According to the responses given, the rate of use of drugs of family members was 44.06% (n=282), the rate of using inexpensive drugs with the same effect was 31.88% (n=204), the rate of problems with drug availability was 4.22% (n=27), the rate of drug recommendation to others with similar complaints was 49.84% (n=319), the rate of proactively prescribing or buying drugs without any disease considering that it might be necessary was 32.97% (n=211), the rate of informing physician about the previously used drugs and

Volume 11 Number 3 p: 294-300

reports on chronic diseases was 91.56% (n=586), and the rate of checking the drugs given are whether the prescribed drugs in the prescription was 33.59% (n=215) (Table 2).

Table 2: Answers to survey questions

	Frequency (%)
Using family members' medications	44.06
Using inexpensive drugs with the same effect	31.88
Difficulties in drug supply	4.22
Drug recommendation for those with similar complaints	49.84
Getting prescription or buying drugs to store at home, considering that it may be necessary	32.97
Informing the physician about the previously used medicines and reports on chronic diseases	91.56
Checking whether the drug given is the prescribed drug when buying prescription medicines	33.59

The question "What are the medications you had prescribed/ bought" was responded with "painkiller" by 62.66% (n = 401). Of the patients, 42.34% (n = 271) responded with "common cold medication", 30.63% (n = 196) with "antibiotics", and 22.66% with vitamins (Table 3).

Table 3. Which drugs you had prescribed/took?

	Prescribed drug frequency (%)
Painkiller	62.66
Common cold medications	42.34
Antibiotics	30.63
Vitamins	22.66
Nasal spray	14.53
Stomach drugs	8.13
Eye drops	6.72
Allergy drugs	1.88
Other	5.47

The question, "If you have food or medicine allergies, will you inform the physician and the relevant health personnel during the examination?" was responded with "yes, I inform" by 84.69% (n=542), "no I don't inform" by 5.78 (n=37), and "I inform if asked" by 9.53 (n=61) (Figure 2).

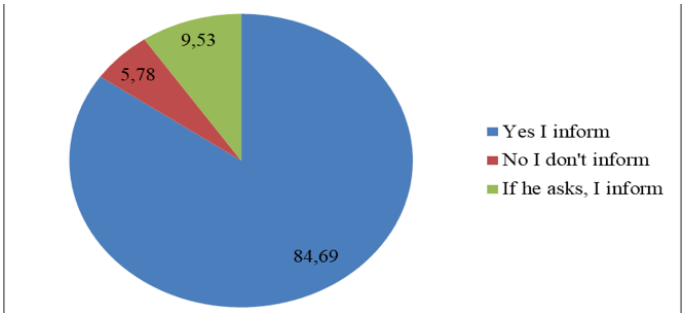

Figure 2. If you have food or medicine allergies, will you inform the physician and the relevant health personnel during the examination?

The question "What do you do in case of an illness?" was responded with "I consult a physician" by 74.21% (n=475), "I try herbal treatment methods" by 8.9% (n=57), and "I consult friends, neighbors, relatives" by 5.16% (n=33). And, 5.6% (n=33) responded with "I try to be treated with medications at home", 2.66% (n=17) with "I consult a pharmacist", and again 2.66% (n=17) with "I ask those who had a similar illness before", and 1.25% (n=8) responded with "I consult nurses / health officers / health personnel" (Figure 3).

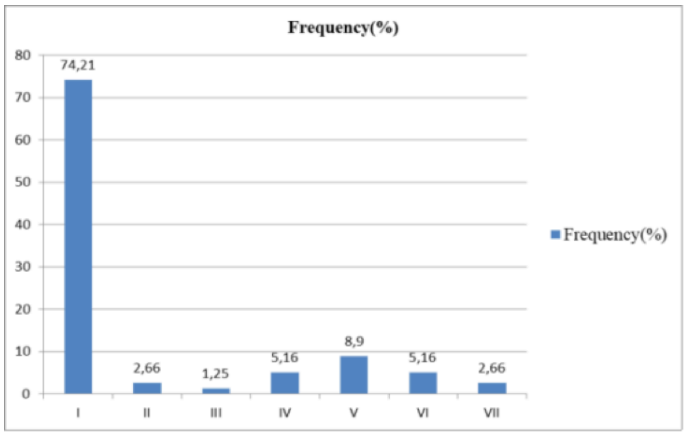

Figure 3. What do you do in case of illness?

I: I consult a physician

II: I consult a pharmacist

III: I consult a nurse, medical officer or health care personnel

IV: I consult friends/neighbors/relatives

V: I try the herbal treatment methods

VI: I try to be treated with the medicine at home

VII: I ask those who have experienced a condition similar to my disease before

The question "How many boxes of drugs are wasted without opening its box in your home each year, due to its expiration date?" was responded with "none" by 27.66% (n=177). Of the participants, 49.06% wastes 1-3 boxes, 10.78% wastes 4-7 boxes, 6.56% 8-10 boxes, and 5.94% wastes more than 10 boxes (Figure 4).

The question "What do you do with family members' remaining medicine after a treatment?" was responded with "I keep them to use when needed" by 75.47% (n=483), "I give them to the pharmacy" by 1.41% (n=9), "I give them to the friends and relatives who want" by 3.37% (n=28), and "I throw them" by 13.59% (n=87) (Figure 5).

The question "How do you use the drugs prescribed by the physician?" was answered with "I use until runs out" by 28.44% (n=182), "I use until until my complaints relieve" by 45% (n=288), "I use as long as the period recommeded by the physician or pharmacist" by 24.06% (n=154) (Figure 6).

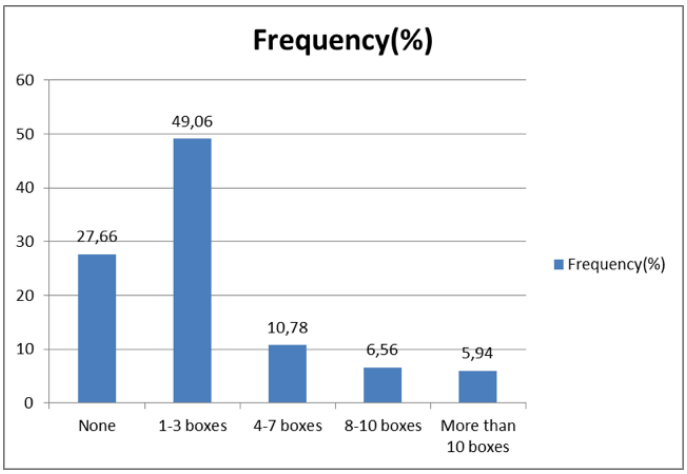

Figure 4. How many boxes of drugs are wasted without opening its box in your home each year, due to its expiration date?

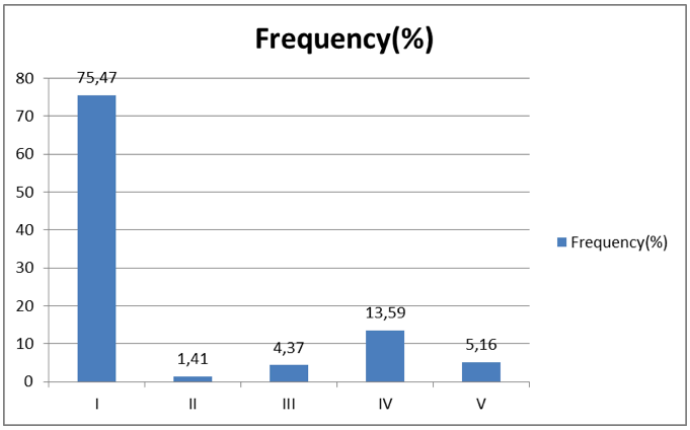

Figure 5. What do you do with family members' remaining medicine after a treatment?

I: I keep them to use when needed

II: I give them to the pharmacy

III: I give them to the interested people I know

IV: I throw them in the trash

V: Other

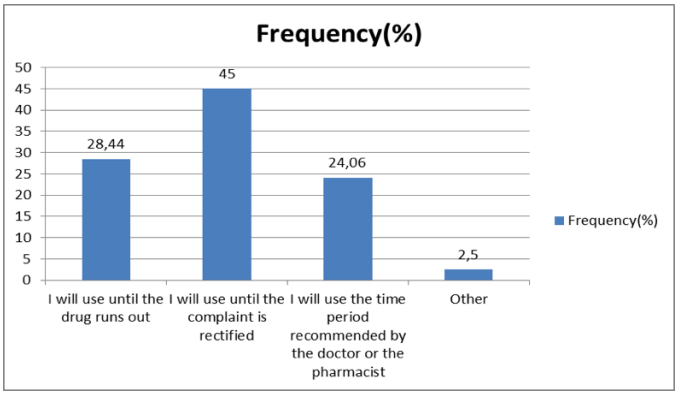

Figure 6. How do you use the drugs prescribed by the physician?

And, the question "In which part of the refrigerator do you store the medicines in your home if you need to keep them in the fridge?" was responded with "In the refrigerator lid" by 76.88% (n=492), "In the refrigerator shelves" by 21.87% (n=140), and "In the freezer/fridge" by 1.25% (n=8) (Figure 7).

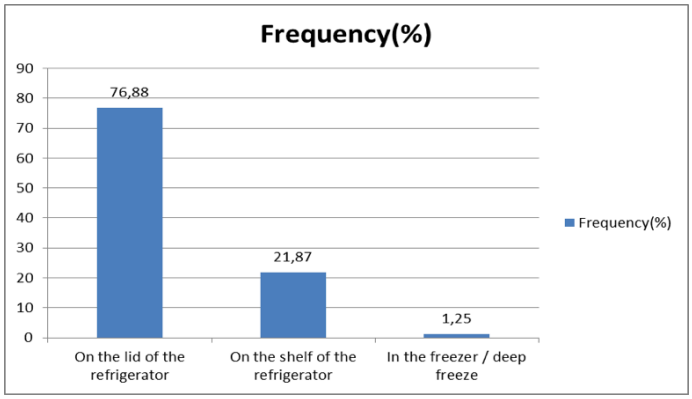

Figure 7. In which part of the refrigerator do you store the medicines in your home if you need to keep them in the fridge?

The question "How do you behave if you encounter side-effects of the drug?" was responded with "I consult physician" by 70.47% (n=451), "I consult pharmacist" by 11.09% (n=71), "I consult nurses/health officers/healthcare personnel" by 5% (n=32), "I seek a solution" by 10.63% (n=68), and "I do nothing" by 2.81% (n=18) (Figure 8).

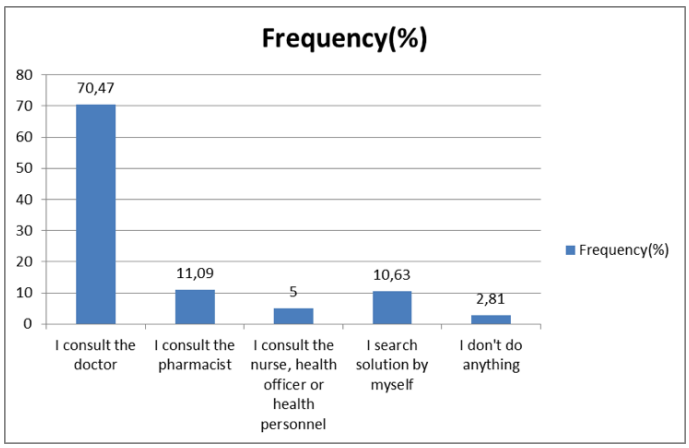

Figure 8. How do you behave if you encounter side effects of the drug?

Discussion

In our study, pharmaceutical drug waste is particularly high. Of the respondents, 27.66% stated that he/she did not waste any medication, but the remaining 72.34% was wasting drugs more or less. Of the participants, 76.88% store the medicine, which must be kept fresh, in the refrigerator lid. However, since there may be temperature changes in the refrigerator lid, it must be stored on the refrigerator shelves. Only 21.87%

keeps the drugs on the shelves of the refrigerator. The ratio of those who use drugs as long as the period recommended by physician was only 24.06%.

The 81.56% rate of "Yes" response to the question "Would you like to receive training on rational drug use?", despite the 19.22% "Yes" to the "Have you received training on rational drug use?" in our study suggests that there is a need for more education on rational drug use.

The 31.88% rate of using the equivalent, but inexpensive drug may reflect trust in the company or there may be a different reason related to bioavailability. The 33.59% rate of "Checking whether the drug given is the prescribed drug when buying prescription medicines" can be attributed to inadequate training. It is seen that most of the medicines prescribed by physicians are painkillers, common cold medications and antibiotics. The rate of informing physicians about food or drug allergies was as high as 84.69%, but since it is a matter of concern, the remaining 15.31% needs an attention.

Another point is that 8.9% of the participants responded with "I try herbal treatment methods" to the question on what to do in case of an illness. Herbal treatments have become popular in recent years. However, since standards are not clear in this respect, it is necessary for physicians to pay attention to this issue. Herbal treatments can present highly toxic effects.

As in the whole world, the use of wrong and unnecessary drugs in Turkey is a serious problem affecting public health [25]. Non-rational drug use leads to decrease in adherence to treatment, drug interactions, resistance to certain drugs, recurrence or prolongation of the diseases, increased frequency of adverse conditions and increased treatment costs for patients [25]. In the rational drug use, it is a prerequisite to take medication in the time recommended by the physician. Especially during the antibiotic use, this issue is neglected and the drugs are taken less than the dose recommended by the physician, accelerating the development of drug resistance. It can be said that it is important and necessary to increase number of education programs towards rational drug use, and to raise awareness in this regard.

Declaration of conflict of interest

The authors received no financial support for the research and/or authorship of this article. There is no conflict of interest.

References

1. Ulupınar S, Akıcı A. Rational drug use in nursing practice. Turkey clinics pharmacol special topics 2015; 3: 84-93.
2. Ojo MA, Igwilo CI, Emedoh T. Prescribing patterns and perceptions of health care professionals about rational drug use in a specialist hospital clinic. J Public Health Afr 2014; 5: 242.
3. Aydın B, Gelal A. Rational drug use: its dissemination and role of medicine education. Dokuz Eylul University Faculty of Medicine Journal 2012; 26: 1: 57-63
4. Gülhan R. Yaşlılarda akılcı ilaç kullanımı. Okmeydani Tip Dergisi 2013; 29: 99-105.
5. Tasdemir S. Rational drug use. Inönü University Vocational School of Health Services Journal 2013; 1: 1-5.
6. Yılmaztürk A. The rational use of drugs in the world and Turkey. Kastamonu University, Faculty of Economics and Administrative Sciences Journal 2013; 2: 42-49.
7. Altındiş S. A Systematic Review of Rational Drug Use. Journal of biotechnology and strategic health research 2017; 1: 34-38.
8. Lal LS, Rosenau PV. Evaluation of rational use of medications in the United States. J Prim Care Community Health 2010; 1: 62-8.
9. Ekenler Ş, Koçoğlu D. Knowledge and practices of individuals on rational drug use. Hacettepe University Faculty Nursing Journal 2016; 3: 44-55.
10. Bian C, Xu S, Wang H et al. A study on the application of the information-motivation-behavioral skills (imb) model on rational drug use behavior among second-level hospital outpatients in anhui, China. PLoS One 2015; 10: e0135782.
11. Özçelikay G. A pilot study on the rational drug use. Ankara University Faculty Of Pharmacy Journal 2001; 30: 9-18.
12. Yılmaz M, Kırbıyıkoğlu Fİ, Ariç Z, Kurşun B. Determination of rational drug use of individuals admitted to a faculty of dentistry hospital. ERÜ Faculty of Health Sciences Journal 2014; 2: 39-47.
13. Barutçu A, Tengilimoğlu D, Naldöken Ü. Evaluation of rational drug use, knowledge and attitudes of citizens: case of Ankara metropolitan districts. Gazi University Journal of the Faculty of Economics and Administrative Sciences 2017; 19:1062-78.
14. Pınar N. Determination of rational drug use patterns of students at Mustafa Kemal University Faculty of Medicine. Mustafa Kemal University Medicine Journal 2017; 8: 34-40.

15. Reddy MR. Advances in rational drug design. Curr Pharm Des 2013; 19: 4673.
16. Acar A, Yeğenoğlu S. Pharmacoeconomics and hospital formulas in respect to rational drug use. Ankara University Faculty Of Pharmacy Journal. 2005; 34: 207-218.
17. İlhan M, Aydemir Ö, Çakır M, Aycan S. Non-rational drug use behaviors: Case of three districts in Ankara. Turkish Journal Of Public Health 2017; 12: 188-200.
18. Kubat H. Physicians' knowledge and attitudes towards the rational drug use and pharmacovigilance. Cukurova Medical Journal 2018; 43: 286-294.
19. Mousavi S, Mansouri A, Jahangard-Rafsanjani Z, Sarayani A, Hadjibabaie M, Gholami K. Bibliographic search of publication patterns in rational use of drugs in Iran: a systematic approach. Acta Med Iran 2014; 52: 76-81.
20. Kıroğlu O, Berktaş F, Şahan E, Karataş Y. Knowledge and awareness of research assistants about rational drug use. Cukurova Medical Journal 2018; 43: 164-171.
21. Gözel M. Rational antibiotic use in adult patients followed-up and treated in outpatient clinic. Cumhuriyet Medical Journal 2012; 34: 527-33.
22. Ramírez D. Computational methods applied to rational drug design. Open Med Chem J 2016; 10: 7-20.
23. Baş FY, Cankara F, Yeşilot Ş. Evaluation of Prescription Drug Use among Medical School Students. SDU Journal of Medical Sciences. 2013; 4: 46-53.
24. Esin MN, Bulduk S, Dural Ç, Şenolan G, Temel E. Drug use behaviors of adult individuals. Florence Nightingale Nursing Journal 2007; 15: 139-45.
25. Özel Ç, Büyüktanır BÖ. Obligation of physicians and pharmacists in provision of information regarding the rational drug use. Journal of Istanbul University Faculty of Law 2008; 66: 327-44.