Vizyoner Dergisi

Süleyman Demirel Üniversitesi Vizyoner Dergisi, Yıl: 2025, Cilt: 16, Sayı: 46, 359-372.
Süleyman Demirel University Visionary Journal, Year: 2025, Volume: 16, No: 46, 359-372.

ISSN: 1308-9552

ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

A RESEARCH ON MEDICINE WASTE AND RATIONAL DRUG USE IN TÜRKİYE*

TÜRKİYE'DE İLAÇ İSRAFI VE AKILCI İLAÇ KULLANIMI ÜZERİNE BİR ARAŞTIRMA

Prof. Dr. Handan ERTAŞ[1]
Şengül SAĞLAM[2]
Yunus Emre TANIŞ[3]
Res. Asst. Mehmet AVDAN[4]
Gamze KIRLI[5]

ABSTRACT

Rational Drug Use is defined as 'a set of rules that require patients to take medicines appropriate to their clinical needs, in doses that meet their personal needs, for a sufficient period of time, at the lowest cost for themselves and society The aim of the study is to examine the rational drug use of individuals between the ages of 18-65 in Türkiye and to evaluate the effects of various socio-demographic factors (such as gender, educational status, chronic disease status, age) on rational drug use. Additionally, it is aimed to provide suggestions on health policies and practices to increase rational drug use. The data are collected through face-to-face survey method and Google form. The research is carried out with 1,015 people by making the necessary universe and sampling calculation. The data are analyzed with SPSS package programme. As a result of the research, there may be significant problems between rational drug use and the recommendation to recommend prescriptions of the same quality as gender, education level, chronic disease status and amount of use. However, no significant relationship is found between the age variable and rational drug use, and the explanatory power of the model varies at 5.1%.

Keywords: Rational Drug Use, Drug Waste, Türkiye, Prescription.

JEL Classification Codes: I11, I15, P10.

ÖZ

Akılcı ilaç kullanımı, hastaların klinik gereksinimlerine uygun olan ilaçları, kişisel ihtiyaçlarını karşılayacak miktarlarda, yeterli süre boyunca ve en düşük maliyetle almalarını gerektiren bir dizi kuralı ifade etmektedir. Bu çalışmanın amacı Türkiye'de 18-65 yaş arası bireylerin akılcı ilaç kullanımını incelemek ve çeşitli sosyo-demografik faktörlerin (cinsiyet, eğitim durumu, kronik hastalık durumu, yaş gibi) akılcı ilaç kullanımına etkilerini değerlendirmektir. Ayrıca akılcı ilaç kullanımının arttırılmasına yönelik sağlık politikaları ve uygulamalarına ilişkin öneriler sunulması amaçlanmaktadır. Bu araştırma da veriler yüz yüze anket yöntemi ve Google form aracılığıyla toplanmıştır. Araştırma, gerekli evren ve örneklem hesaplaması yapılarak 1.015 kişi ile gerçekleştirilmiştir. Veriler SPSS paket programı ile analiz edilmiştir. Araştırma sonucunda, akılcı ilaç kullanımı ile cinsiyet, eğitim durumu, kronik hastalık durumu ve kullanım miktarı ile eşdeğer nitelikte reçete önerme görüşü arasında anlamlı ilişkiler bulunmuştur. Ancak, yaş değişkeni ile akılcı ilaç kullanımı arasında anlamlı bir ilişki tespit edilmemiştir ve modelin açıklayıcı gücü %5,1 olarak bulunmuştur.

Anahtar Kelimeler: Akılcı İlaç Kullanımı, İlaç İsrafı, Türkiye, Reçete.

JEL Sınıflandırma Kodları: I11, I15, P10

* For this study the approval of ethical committee no 2024/84 dated 31.01.2024 was taken from the Health Sciences Non-Interventional Clinical Research Ethics Committee, Selçuk University.

[1] Selçuk University, Faculty of Health Sciences, Department of Health Management, handanertas@selcuk.edu.tr

[2] Selçuk University, Health Sciences Institute, Department of Health Management, PhD student, sengulsaglammm61@gmail.com

[3] Selçuk University, Health Sciences Institute, Department of Health Management, PhD student, y.emretanis94@icloud.com

[4] İstanbul Medipol University, Faculty of Health Sciences, Department of Health Management, mehmetavdan96@gmail.com

[5] Selçuk University, Health Sciences Institute, Department of Health Management, PhD student, unvergamze296@gmail.com

Makale Geliş Tarihi / Received : 23.06.2024
Makale Kabul Tarihi / Accepted : 23.12.2024

https://doi.org/10.21076/vizyoner.1503656

Süleyman Demirel Üniversitesi Vizyoner Dergisi, Yıl: 2025, Cilt: 16, Sayı: 46, 359-372.
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ISSN: 1308-9552

GENİŞLETİLMİŞ ÖZET

Amaç ve Kapsam:

Yaşadığımız yüzyılda akılcı ilaç kulllanımı sağlık sunumunun en önemli parçasını oluşturmaktadır. Akılcı ilaç kullanımının tanımı ilk kez Dünya Sağlık Örgütü tarafından 1985 yılında Nairobi'de yapılan toplantıda yapılmıştır. Bu tanıma göre akılcı ilaç kulllanımı hastaların ilaç alabilmesi için uyulan kuralların tamamıdır. Akılcı ilaç kullanımı, kişilerin klinik bulgularına ve bireysel özelliklerine göre uygun ilacı, uygun süre ve dozajda, en uygun maliyetle ve kolayca sağlayabilmeleridir. İlaçların yan etki, tolerans, direnç, bağımlılık ve yüksek sağlık harcamaları gibi olumsuz sağlık sonuçları, ilaçların akılcı kullanımının gerekliliğini göstermektedir. Hastane yönetiminin kaynakların etkin kullanımı açısından, önlenebilir israf nedenlerine odaklanması gerekmektedir (Aslan ve Demir, 2023: 80). Bu çalışmanın amacı Türkiye'de ikamet etmekte olan 18-65 yaş arası bireylerin akılcı ilaç kullanım durumlarını incelemektir.

Yöntem:

Araştırma evrenini Türkiye'de ikamet etmekte olan 18-65 yaş aralığındaki bireyler oluşturmaktadır. TÜİK 2022 verilerine göre Türkiye'de 18-65 yaş arası bireylerin sayısı 85 milyondur. Örneklem sayısı Yazıcıoğlu ve Erdoğan (2004) tarafından oluşturulan örneklem tablosu kullanılarak belirlenmiştir. Araştırma verilerinin elde edilmesinde Google form uygulaması ve yüz yüze anket yöntemi kullanılmıştır. Aktaş ve Selvi (2019) tarafından oluşturulan Yetişkinlerde Akılcı İlaç Kullanımı Farkındalığı Ölçeği kullanılmıştır. Ölçek formu 15 ifadeden oluşmaktadır. Araştırma verileri SPSS programı ile analiz edilmiştir.

Bulgular:

Çalışmaya katılanların % 42,3'ü 18-24 yaş aralığında olduğu; % 58,4'ü lisans mezunu olduğu; % 59,2'sinin kadın olduğu tespit edilmiştir. Yapılan analizlere göre akılcı ilaç kulllanımı ile cinsiyet, yaş grubu, eğitim düzeyi ve kullanım sayısı veya miktarı arasında anlamlı bir farklılık olduğu ancak kronik hastalık durumu ile arasında anlamlı bir farklılık olmadığı, eşdeğer kalitede ilaç yazılması ve fazla verilmemesi önerisine %73.3'ünün evet cevabı verdiği tespit edilmiştir.

Sonuç ve Tartışma:

Araştırma sonucunda, akılcı ilaç kullanımı ile cinsiyet, eğitim durumu, kronik hastalık durumu ve kullanım miktarı ile eşdeğer nitelikte reçete önerme görüşü arasında anlamlı ilişkiler bulunmuştur. Cinsiyet değişkeni, akılcı ilaç kullanımı üzerinde pozitif ve anlamlı bir etkiye sahiptir. Yani, kadın bireylerin akılcı ilaç kullanımının, erkeklere göre 0.08 birim daha fazla olduğu görülmektedir. Bu durum, cinsiyetin akılcı ilaç kullanımı açısından belirleyici bir faktör olduğunu göstermektedir. Eğitim durumu ile akılcı ilaç kullanımı arasında negatif ve anlamlı bir ilişki bulunmuştur. Eğitim düzeyi arttıkça, bireylerin akılcı ilaç kullanımı 0.05 birim azalmaktadır. Bu sonuç, daha yüksek eğitim seviyesine sahip bireylerin, akılcı ilaç kullanımı konusunda daha dikkatli ve bilinçli olabileceklerini, dolayısıyla daha az ilaç kullanma eğiliminde olduklarını gösterebilir. Kronik hastalık durumu ile akılcı ilaç kullanımı arasında da negatif negatif ve anlamlı bir ilişki tespit edilmiştir. Kronik hastalığı olan bireylerin, olmayanlara kıyasla akılcı ilaç kullanımının 0.09 birim daha düşük olduğu bulunmuştur. Bu durum, kronik hastalığı olan bireylerin tedavi süreçlerinde daha fazla ilaç kullanıyor olmalarına rağmen, akılcı ilaç kullanımı konusunda daha fazla dikkat edilmesi gerektiğini göstermektedir. Kullanım miktarı ile eşdeğer ilaç reçete edilmesi görüşündeki bir birimlik artış, akılcı ilaç kullanımını 0.07 birim artırmaktadır. Yani kullanım miktarı ile eşdeğer ilaç reçetesi yazılması konusunda daha fazla onay veren bireyler, akılcı ilaç kullanımına daha yatkın olmaktadır. Ancak, yaş değişkeni ile akılcı ilaç kullanımı arasında anlamlı bir ilişki tespit edilmemiştir ve modelin açıklayıcı gücü %5,1 olarak bulunmuştur. Akılcı ilaç kullanımı ile cinsiyet, yaş, eğitim düzeyi ve kronik hastalık durumu arasında anlamlı farklılık tespit edilmiştir. Benzer şekilde Çavdar ve Suvak (2023) tarafından yapılan bir gelişmede akılcı ilaç kullanımı bilgisi ile cinsiyet, yaş ve eğitim düzeyi arasındaki önemli konular ele alınmıştır. Elde edilen bulgular literatürü destekler niteliktedir. Sülük ve Erdem (2018) tarafından yürütülen çalışmada sağlık yönetimi alanında çalışan öğretim üyeleri ve lisansüstü öğrenciler tarafından akılcı ilaç kullanımı ve farmasötikleşme düzeyinde değerlendirilmiştir. Yılmaz vd., (2014) çalışmasında ise, demografik veriler (cinsiyet, eğitim düzeyi) ile " tanıdıkları aracılığıyla ilaç yazdırma ve ilaç alma; reçetede yer alan ilacı kontrol etme, kullanmakta olduğu ilacın son kullanma tarihini kontrol etme; reçetesiz bir şekilde kendi kendine veya komşu tavsiyesi ile ilaç kullanma" tutumları arasında ilişki bulunmadığı görülmüştür. Bu yönüyle elde edilen bulguların literatürü desteklemediği görülmektedir. Araştırma sonucunda toplumun ilaç kullanmayı sevdiği ve tedbir amaçlı da olsa ilaç yazması için doktora başvurdukları tespit edilmiştir. Çalışma sonucunda akılcı ilaç kullanımına ilişkin bilgi ve eğitimlerin arttırılması, kullanım miktarı ile eşdeğer ilaç yazılması gibi önerilerde bulunulmuştur. Literatürde akılcı ilaç kullanımına ilişkin çeşitli örnekler incelenmiş ve kullanım düzeyleri belirlenmiştir. Çalışmanın Türkiye genelinde 18-65 yaş arası kişilerle gerçekleştirilecek önemli bulguların bir araya getirilmesi açısından fark yaratacağı ve literatüre katkı sağlayacağı düşünülmektedir. Çalışma neticesinde ortaya konulan bulgulara dayanarak, gelecekte yapılacak çalışmalara ışık tutmak için şu öneriler değerlendirilebilir: Akılcı ilaç kullanımını teşvik etmek için toplumun her kesimine yönelik bilinçlendirme kampanyaları düzenlenmesi, sağlık profesyonellerinin eğitimlerinin güçlendirilmesi ve ilaç kullanımıyla ilgili doğru bilgilere erişimin artırılması yer almaktadır. Ayrıca, akılcı ilaç kullanımını desteklemek amacıyla reçete yazımı ve ilaç dağıtımı süreçlerinde iyileştirmeler yapılması gerekmektedir. Farklı yaş grupları ve eğitim seviyelerine yönelik özelleştirilmiş eğitim ve farkındalık kampanyalarının düzenlenmesi gerekmektedir.

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ISSN: 1308-9552

1. INTRODUCTION

The World Health Organization (WHO) defines the drug as 'A substance or product used or intended to be used to explore or modify physiological systems and pathological conditions for the benefit of the user (WHO, 1987). Meanwhile, rational drug use is defined as prescribing and distributing the suitable drug to the suitable patient in the diagnosis, prevention and treatment of the disease (WHO, 2002; Mekonnen et al., 2021, p. 159). Irrational drug use is the way of drug consumption unsuitable for this definition. Polypharmacy (excessive use of medication per patient), inappropriate use of antimicrobials, overuse of injection, failure to follow prescribing based on clinical guidelines and inappropriate self-medication are among the common examples of irrational drug use (WHO, 2011; Özdamar & Mutlu, 2021, p.14). The World Health Organization (WHO) defines the waste of drug as the drugs, vaccines, and serums that are no longer needed, must be disposed of appropriately, expired, not used, spilled and contamined pharmaceutic products (WHO, 1985; Aslan & Kanmaz Demir, 2023, p. 80).

Administrative arrangements are made in Türkiye to provide rational drug use and to prevent waste of drug. Within this scope, while red prescription are generally used for prescription of narcotic opioid drugs, green prescription are generally used for psychotropic drugs including pregabalin. Besides these, white controlled prescription are also among the controlled drugs. After the colored controlled paper prescriptions, electronic colored controlled prescription system became operational in Türkiye (Badur et al., 2022, p. 314). Similarly, as a part of Health Transformation program, there are institutional structuring for rational drug use and materials management, national drug administration, and a health information system providing effective information in the process of medical device set up and decision making process. In this program, aims towards rational drug use is also seen (Cansever & Tüfekçi, 2020, p. 620). In many countries, under the leadership of the World Health Organization, the 'Rational Use of Medicines Program' has been initiated. The source, which was published by the World Health Organization in 1994 under the name of 'Guide to good Prescribing', was translated into Turkish in January 2000 by the Ministry of Health of the Republic of Türkiye under the name of 'Good Prescribing Guide'. The guideline also covers rational drug use in line with the general principles of rational pharmacotherapy (Yılmaztürk, 2013, p. 44).

Overuse or misuse of drugs puts the health of patient into danger and leads to waste of drugs. Negative results such as side effects, tolerance development, resistance, addiction and high health expenses lay emphasis on rational drug use (Altındiş, 2017, p. 35). Among the stakeholders responsible for rational drug use are doctors who prescribe the drugs, pharmacists who provide the drugs, health workers who apply the drugs, patients and their relatives who continue the treatment, the government and pharmaceutical industry (Özçelikay, 2001, p. 11).

In the study by Günel and Demirtaş (2024), the knowledge levels of young and elderly patients with chronic diseases regarding drug compliance and rational drug use were examined. As a result of the study, it is suggested that it would be beneficial for nurses to educate patients about the frequency and timing of drug use to reduce irrational applications such as non-prescription drug use and taking drugs with the recommendation of others (Günel & Demirtaş, 2024, p. 83). In the study of Deniz (2019), it was determined that 20, 3 % of individuals use medicine based on their experience, 52,8% buy medicine from the pharmacies without a prescription, 28, 4 % take medicine on the advice of their friends, neighbors and acquaintances and 81, 4 % keep medicine at home and use painkillers the most without seeing a doctor. Yalçın (2024) examined the rate of rational drug consumption by comparing the levels of prescription and non-prescription drug use in certain countries of the European Union and Türkiye. The findings revealed that, while Türkiye consults doctors sufficiently compared to other European Union countries, it falls behind in terms of prescription drug use.

The main aim of this study is to examine the rational drug use of individuals between the age of 18-65 residing in Türkiye. Various examples of rational drug use was examined in the literature and usage levels was determined. It is foreseen that the study conducted among the individuals between the age of 18-65 across Türkiye will make a difference about gathering important findings and will have significant effect to the field.

2. CONCEPTUAL FRAMEWORK

2.1. Medicine Waste

According to TDK, waste means 'unnecessary expenditure, unnecessary consumption'. In the context of our topic, it is interpreted that it means waste of medicine, unnecessary use of medicines or supplying too much medicine and throwing them away without being used.

According to estimates by the World Health Organization (WHO, 2024), more than half of medicines are prescribed, dispensed or used inappropriately. Half of the patients do not take their medications correctly; in addition, misuse; It causes waste of resources and health risks. Irrational drug use is a more common problem, especially in developing countries where community pharmacies are the main source of drugs (Bayraktar & Ulutaş Deniz, 2024, p. 24). In this sense, Türkiye can be cited as an example of a country where medicine waste is common. According to the data of the Ministry of Industry and Technology of the Republic of Türkiye (2020, p. 11), approximately 2.4 billion boxes of medicines were sold in the Turkish pharmaceutical market. Even if this situation is considered as a positive outcome for the pharmaceutical industry, increasing the number will also mean increasing waste.

Rational consumption in economics refers to consumers purchasing products and services in line with their income and needs (Ceyhan & Taş, 2017, p. 112). The main reason for waste in general is; It is not knowing how to use the resources used to meet needs and desires rationally and efficiently (Ministry of Commerce, 2018, p.10). So can consumer education reduce waste? WHO (2024) emphasizes public education and the inclusion of problem-based pharmacotherapy training in undergraduate programs to promote rational drug use.

Again, in drug consumption, a large part of the waste can be reduced by meeting the criterion of suitability for need, which is the main purpose of consumption. Ensuring rational drug consumption; It is under the responsibility of actors such as physicians, pharmacists, nurses, other healthcare personnel, patients and their relatives, professional organizations, academia and the media, especially the state authority (Öztürk & Acar, p. 2021). In other words, in this context, a collective awareness and sensitivity needs to be provided. As a matter of fact, the WHO (2012, p. 1) report focuses on the meaning of the term "responsible use of medicines" and emphasizes that this concept requires a harmonious work by all stakeholders in the health system. According to this report, responsible use of drugs can be ensured as follows; Patients should have timely access to the drugs they need, the drugs must be used in accordance with the prescription, the dosage and duration of treatment must be correct, all parties such as healthcare professionals (doctors, pharmacists), patients, drug manufacturers, regulatory bodies must contribute to this process, responsible use of drugs must be ensured by available resources. Efficient use is important because drug production and distribution is done with limited resources. In summary, rational drug consumption is a process that requires coordination and conscious approach of all health system stakeholders and the public.

2.2. Rational Drug Use

Medicines make a great contribution to the health and well-being of human beings; it is a very important point in the prevention and treatment of diseases (Wagner et al., 2014; Ahmadiani and Nikfar, 2016; Sema et al., 2021, p. 52). Rational drug use is essential in healthcare, focusing on providing patients with medications that are suitable for their clinical conditions, in the correct dosages, for an adequate duration, and at the minimal cost to both themselves and their surroundings. The concept includes not only the appropriate prescription of the drugs but also the appropriate distribution and consumption (Arıkan et al., 2016, p. 93). Irrational drug use is a global issue, with over 50% of all medications being improperly prescribed or dispensed worldwide. Additionally, 50% of patients either do not adhere to these medications or use them incorrectly (Blum, 2000; Gebremariam & Ahmed, 2019, p. 2). Inappropriate use of drugs is a worrying issue that brings many undesirable consequences with it such as an increase in drug cases, drug reactions, drug waste and a decrease in the quality of drug treatment (Bharity et al., 2008; Nyabuti et al., 2020, p.1). It includes rational drug use (good diagnostic practice and good prescribing practice, i.e. safe, effective and cost-efficient drug provision for the patient's benefit), rational distribution (ensuring the correct medication is given to the right patient in the appropriate form or dosage, providing suitable counseling, clear instructions, and effective stock management), and rational patient selection (ensuring patient adherence) (WHO, 1993; Mamo & Alemu, 2020, p. 15).

Hospital administration needs to focus on preventable causes of waste in terms of the sufficient use of the sources (Aslan & Demir, 2023, p. 80). Despite all its obvious benefits, the practice of rational drug use faces several challenges. Within this frame, insufficient education about rational prescription principles is a significant obstacle. Patients often expect fast solutions such as prescriptions and this could force healthcare providers to prescribe unnecessarily (Badur, 2022, p. 314). It was determined that the most common causes of drug waste are preparing mistakes, change of treatment and drug reactions (Aslan & Demir, 2023, p. 81).

2.3. Literature Review

The Turkish healthcare system is associated with a combination of public and private healthcare facilities and a general health insurance system managed by the Social Security Institution (SGK) (Badur, 2022, p. 314). The situation related to rational drug use in Türkiye is a critical topic in terms of healthcare system and reflects the difficulties and developments in many other countries. The amount of medical waste in Türkiye is approximately 80,000 tons annually (Arıkan et al., 2016, p. 96). The study conducted by Özdinç et al. (2015) made significant contributions to the evaluation of drug use habits in Türkiye and whether these habits are rational. The results shows that health politics and applications needs to be reviewed to improve the drug use. It is suggested to expand education and awareness activities to encourage rational drug use.

The study of Çalıkoğlu et al. (2019) analyzed the prescription behaviors of family practitioners and rational drug use applications. The study of Çalıkoğlu et al. (2019) analyzed the prescription behaviors of family practitioners and rational drug use applications. It is noted that because children rely on their parents for medication, the attitudes and behaviors of parents regarding medication use significantly impact their children's illnesses and treatment processes.

Sezer et al. (2022) examined the attitudes and behaviors of parents of primary school children in Türkiye towards drug use and determined their tendencies in this field. The study revealed that most parents attach importance to physician advice when giving medication to their children, but in some cases, they make the decision to take medication on their own. The study conducted by Aslan & Demir (2023) evaluates the causes of drug waste in a university hospital with a general perspective. The research provides information not only drug waste causing financial losses but also the negative effects on the environment and health. The study determines the main causes of the waste and discusses how rational drug use application plays a role in reducing this problem.

The study conducted by Çelik et al. (2013) analyzes the adaptation to rational drug use and the factors affecting drug waste. The research determined the levels of awareness among healthcare professionals and patients regarding rational drug use, the effects of these levels on drug waste, and the strategies required for improvements in drug use processes.

Rational drug use is crucial for human life however, the results indicated that people do not have enough awareness about the issue. For this reason, sufficient and effective information about rational drug use needs to be provided (Doğan, 2020, p. 55).

3. MATERIAL AND METHOD

3.1. The Aim and Question of the Research

The main aim of this study is to examine the rational drug use of individuals between the age of 18-65 residing in Türkiye. Within the purpose of this study, which is a quantitative research type, the research questions are as follows:

- Is there a statistical difference between rational drug use and gender?
- Is there a statistical difference between rational drug use and age group?
- Is there a statistical difference between rational drug use and educational status?
- Is there a statistical difference between rational drug use and chronic disease?
- Is there a statistical difference between rational drug use and recommending the amount or amount of use be prescribed and that an equivalent drug be prescribed and not to give more?
- Is there a statistically significant relationship between individuals' rational drug use and socio-demographic variables?
- Are the variables of gender, age, educational status, chronic disease, amount of use, and opinion on prescribing equivalent drugs a significant predictor of individuals' rational drug use levels?

3.2. Population and Sample of the Research

The study was conducted in February- April 2024 among individuals between the ages of 18-65 residing in Türkiye. According to TSI 2022 data, the number of individuals between the ages of 18-65 in Türkiye is 85 million. The number of people to be sampled was determined by using the sample sizes table created by Yazıcıoğlu and Erdoğan (2004). As a result of the calculations, the sample size was determined as 908. Within the scope of the research, 1015 people were reached.

3.3. Research Ethic

Written consent was secured from the Selçuk University SBF Non-invasive Clinical Research Ethics Committee (Date: 31.01.2024, Issue: 2024/84).

3.4. Data Collection and Analysis

The research data was gathered through Google Forms and face-to-face surveys. The survey preparation utilized the Rational Drug Use Awareness Scale in Adults, developed by Aktaş and Selvi (2019). This scale comprises 15 statements. The data collected from the research were analyzed using the SPSS software. Skewness and kurtosis coefficients were assessed to determine the data's adherence to a normal distribution. Coefficients within the range of -1 to +1 suggest a normal distribution (George & Mallery, 2001; Leech et al., 2005). Skewness and kurtosis coefficients for the Rational Drug Use Scale were determined as 0.097 and -0.140, respectively. This shows that the data is normally distributed. In the reliability analysis conducted in the study, the Cronbach Alpha value of the Rational Drug Use Scale was found to be 0.78. According to the literature, values in the range of $0.60 \leq \alpha \leq 0.80$ show that the scale is quite reliable (Özdamar, 2004).

3.5. Research Inclusion Criteria

Participation in the research is voluntary and consists of men and women between the ages of 18-65 living in Türkiye. These criteria were included in the survey form and those outside of it were not included in the research.

3.6. Data Collection Tool

Rational Drug Use in Adults Awareness Scale was used in research.

The scale form was created by Aktaş and Selvi (2019). The scale form consists of 15 statements. The KMO value calculated for compliance with factor analysis was found to be 0.902 and the calculated value (chisquare: 1732.66, $p<0.001$) was determined as a result of Barlett test. As a result of these two findings, the fit indices calculated by factor analysis of the data set were RMSEA: 0.04; CFI: 0.98; GFI: 0.93; AGFI:0.91; RMR:0.06. Cronbach's Alpha coefficient was found to be 0.83.

3. FINDINGS

In the analysis of survey data, t-test was applied between rational drug use and variables, and ANOVA test was applied for comparisons of more than two groups.

3.1. Descriptive Statistics

Data regarding the demographic characteristics of the participants are seen in Table 1.

Table 1. Frequency Distributions According to Demographic Characteristics of Participants

Variable	Category	Frequency	Percentage
Gender	Female	601	59.2
	Male	414	40.8
Age Group	18-24	429	42.3
	25-34	356	35.1
	35-44	137	13.5
	45-65	93	9.2
Educational Status	Primary School	40	3.9
	High School	179	17.6
	Vocational High	75	7.4
	Bachelor's Degree	592	58.4
	Postgraduate (Master's or PhD)	129	12.7

Variable	Category	Frequency	Percentage
Do you have a chronic disease?	Yes	180	17.7
	No	835	82.3
Recommendation to prescribe medication equivalent to the amount or amount of use, and not to give more	Yes	744	73.3
	No	271	26.7
	Total	**1015**	**100**

According to Table 1, 59.2% of the participants (601 people) were women; 40.8% (414 people) were male; 42.3% (429 people) were in the 18-24 age group; 58.4% had a bachelor's degree; 82.3% (835 people) did not have a chronic disease; It was determined that 73.3% said yes to the question "Would you like to be prescribed equivalent medication in terms of the amount or amount of use and not giving more?"

Table 2. t Test Results with Gender

Scale	Gender	n	Mean	Ss.	*t*	p
Rational Drug Use	Female	601	3.61	.483	**3.998**	**0.001**
	Male	414	3.48	.501		

The t-test results shown in Table 2 revealed a statistically significant difference between gender and rational drug use ($p<0.05$).

Table 3. Results of the t Test Performed to Recommend Prescribing Medication Equivalent to the Amount or Amount of Use and not to Give more than it

Scale	Answer	n	Mean	Ss.	*t*	p
Rational Drug Use	Yes	734	3.60	.434	**6,637**	**0.001**
	No	270	3.39	.452		

The t-test results in Table 3 showed a statistically significant difference between the frequency or amount of medication use and the recommendation to prescribe equivalent medication without exceeding that amount, and rational drug use ($p<0.05$).

Table 4. t Test Results with Chronic Disease Status

Scale	Answer	n	Mean	Ss.	*t*	p
Rational Drug Use	Yes	180	3.56	.478	**-0.107**	**0.913**
	No	835	3.56	.498		

The t-test results in Table 4 indicated that there is no statistically significant difference between chronic disease status and rational drug use ($p>0.05$).

Table 5. ANOVA Findings with Age

Scale	Age	n	Mean	Ss.	*F*	p	Post-hoc (Tukey)
Rational Drug Use	1.18-24	429	3.46	.512	**11.472**	**0.001**	**1<2,1<3**
	2.25-34	356	3.65	.473			
	3.35-44	137	3.64	.444			
	4.45-65	93	3.51	.476			
	Total	1015	3.56	.494			

The ANOVA results in Table 5 revealed a significant difference between rational drug use and age ($p<0.05$). To further investigate this difference, a post hoc (Tukey) test was conducted. The findings indicate that individuals aged 18-24 exhibit higher rational drug use compared to those aged 25-44.

Table 6. ANOVA Findings with Education Level

Scale	Faculty	n	Mean	Ss.	*F*	p	Post-hoc (Tukey)
Rational Drug Use	1.Primary School	40	3.46	.401	**19.539**	**0.001**	**1<2, 3<2,4,5**
	2.High School	179	3.56	.439			
	3.Associate Degree	75	3.12	.371			
	4.Bachelor's Degree	592	3.60	.518			
	5.Postgraduate	129	3.68	.401			
	Total	1015	3.56	.494			

The ANOVA test results presented in Table 6 identified a statistically significant difference between rational drug use and education level ($p<0.05$). To explore this difference further, a post hoc (Tukey) test was conducted. The results indicate that individuals with bachelor's and postgraduate degrees demonstrate higher levels of rational drug use compared to those with other educational backgrounds.

Table 7. The Relationship between Rational Drug Use and Socio-Demographic Variables

	Rational Drug Use
Age	0.035
Gender	0.118**
Educational Status	-0.168**
Chronic Disease	-0.102**
Prescribing drugs equivalent to the amount of use	0.097**

According to Table 7, the relationship between rational drug use and gender is positive and significant ($r = 0.118$, $p <0.01$). A negative relationship was found between educational status and rational drug use ($r = 0.168$, $p <0.01$). Chronic disease status also shows a negative relationship with rational drug use ($r = 0.102$, $p<0.01$). While there is a positive and significant relationship between the number of uses and the opinion of prescribing equivalent drugs and rational drug use ($r = 0.097$, $p < 0.01$), there is a very weak and non-significant relationship between age and rational drug use ($r = 0.035$, $p > 0.05$).

Table 8. Multiple Linearity Statistics

	VIF	**Margin of Error**
Gender	1.05	0.026
Educational Status	1.10	0.013
Chronic Disease	1.21	0.036
Age	1.02	0.029
Prescribing drugs equivalent to the amount of use	1.29	0.015

According to Table 8, it is shown that the VIF values for the same drug prescribing variables as gender, educational status, chronic disease, age and amount of use do not show multiple deficits, being less than 10 and 1.

In the multiple regression model, individuals' rational drug use was taken as the dependent variable, while individuals' gender, educational status, chronic disease, age, amount of use and prescription of equivalent drugs were taken as independent variables. As a result of multiple regression analysis, the model was found to be statistically significant ($F (5,1009) =10.859$, $p<0.05$). In the model, it was observed that 5.1% of the variance in the rational drug use level of individuals was explained by independent variables ($R2 = 0.051$). This indicates that the explanatory nature of the model is limited. Table 9 shows the independent variables included in the model and the effect sizes of these variables.

Table 9. Multiple Regression Model and Coefficient Information on Variables

	Non-standard coefficients		Standard Coefficients	t	p
	B	Std. Error	Beta		
Constant Value	3.38	0.10		32.117	0.000
Gender	0.08	0.02	0.09	3.093	0.002*
Educational Status	-0.05	0.01	-0.14	-4.395	0.000*
Chronic Disease	-0.09	0.03	0.09	-2.682	0.007*
Age	-0.02	0.01	0.02	-1.342	0.180
Prescribing drugs equivalent to the amount of use	0.07	0.01	0.08	2.716	0.007*

According to Table 9, in the model, individuals' gender, educational status, chronic disease status and amount of use and the opinion of prescribing equivalent drugs are statistically significant; It was found that the age variable was not statistically significant. The equation of the multiple regression model is shown below.

'Rational Drug Use = 3.387 + 0.08 x Gender - 0.05 x Educational Status - 0.09 x Chronic Disease + 0.07 x Prescribing equivalent drugs with the amount of use'.

According to this model, when gender increases by 1 degree in individuals' rational drug use, rational drug use increases by 0.08 units; If the educational level increases by 1 degree, rational drug use decreases by 0.05 units; Rational drug use of individuals with chronic diseases decreased by 0.09 units compared to individuals without chronic diseases; It is seen that a one unit increase in the amount of use and the opinion of prescribing equivalent drugs increases rational drug use by 0.07 units.

4. CONCLUSION

The study aimed to examine the rational drug use of individuals between the ages of 18-65 residing in Türkiye. The majority of participants agree that medications should be prescribed in an equivalent quantity or amount. It was determined that this situation supports the suggestion that necessary arrangements should be made to reduce drug waste.

According to the results of the multiple regression analysis, significant relationships were found between rational drug use and gender, educational status, chronic disease status and amount of use and prescription of generic drugs. Gender variable has a positive and significant effect on rational drug use. In other words, it is seen that the rational drug use of female individuals is 0.08 units higher than that of males. This shows that gender is a determining factor in terms of rational drug use. Similarly, in the study conducted by Öztürk and Acar (2021), it was determined that female students had a higher level of knowledge of rational drug use than male students. A negative and significant relationship was found between educational status and rational drug use. As the education level increases, the rational drug use of individuals decreases by 0.05 units. This result may indicate that individuals with higher education levels may be more careful and conscious about rational drug use, therefore they tend to use less medication. In their study, Tosun and Hoşgör (2021) found that individuals with at least a university degree had a higher and significant average of rational drug use. A negative and significant relationship was also detected between chronic disease status and rational drug use. People with chronic disease have a 0.09 unit lower temperature with smart drug treatment compared to those without. This may indicate that although people use more drugs in the treatment of chronic diseases, more attention should be paid to rational drug use. Similarly, in a study conducted by Benlier et al. (2019), it was found that the number of chronic smart drug treatments could be low. The findings support this extensive literature. A one unit increase in the amount of use and the negotiation of a generic drug prescription increases, and rational drug treatment increases by 0.07 units. That is, companies that give more approval for the use of drugs and the prescription of generic drugs continue to be more likely to use rational drugs. This relationship suggests that healthcare professionals' more medication-oriented approach to drug prescriptions may promote rational therapeutic treatment. On the other hand, no significant relationship was found between the age variable and rational drug use. However, in the study conducted by Duman and Karadağ (2024) in the literature, it was determined that the knowledge level of elderly individuals regarding rational drug use is insufficient. The findings obtained are different from the literature in this respect.

The overall explanatory nature of the model is limited to the fact that the independent variables explain only 5.1% of the variance in rational drug use. This shows that the explanatory power of the model is low, but some independent variables have significant effects on rational drug use. These findings suggest that strategies to increase rational drug use in health systems should focus on policy changes, especially regarding educational attainment, chronic disease status, and drug prescriptions.

A significant difference was found between rational drug use and gender, age, education level and chronic disease status. Similarly, in a study conducted by Çavdar and Suvak (2023), statistically significant relationships were found between the level of rational drug use and demographic data (gender, age and education level). In addition, in a study conducted by Uçman and Uysal (2021), it was determined that there were statistically significant differences in the rational drug use knowledge levels of individuals according to demographic data (demographic factors) and the city of residence, having children and receiving education on health, and this study also revealed similar results. In Ekici's study (2024), it was found that dentists had insufficient knowledge about rational drug use, indicating a need for improved education on the topic. Sezer et al. (2022) discovered that 44.5% of parents reported using non-prescription drugs when their children were ill. Statistical analysis revealed significant differences based on the parents' education levels in habits such as reading the drug's package insert, checking the expiration dates of medications at home, altering the prescribed dosage without consulting a doctor, and using non-prescription antibiotics. These findings support that there is a significant relationship between age groups and knowledge of rational drug use. In the study by Sülük and Erdem (2018), the rational drug use and pharmaceuticalization levels among faculty members and graduate students in health management were assessed. The findings revealed that the general population tended to prefer using medication, frequently visited physicians to obtain prescriptions, and often used medication for preventive purposes.

However, in a study by Şengül and Akyıl (2022), it was found that social security, marital status, age, regular exercise, education level, and knowledge about drug use influenced rational drug use (RDU) knowledge levels. No significant statistical relationship was found with the other variables. In the study by Yılmaz et al. (2014), it was noted that there was no correlation between demographic factors (such as gender and education level) and prescribing behavior and taking medication through acquaintances; checking the medication in the prescription, checking the expiration date of the medication they are using; checking the medication on their own or without a prescription" neighbor's advice and drug use attitudes. It is seen that the findings obtained in this aspect do not support the literature.

This study presents important findings regarding the factors influencing rational drug use and the relationships among these factors. Variables such as gender, age groups, education level, the presence of chronic diseases, and drug use recommendations were evaluated for their effects on rational drug use.

The findings indicate a statistically significant difference between gender and rational drug use, with women (59.2 %) exhibiting a higher rate of rational drug use compared to men (40.8%). This emphasizes the importance of considering gender in the provision of health services.

When examining the relationship between age groups and rational drug use, individuals aged between 18-24 (42.3%) showed a higher level of rational drug use compared to those aged between 25-65 (57.8%). These findings highlight the importance of health awareness and proper guidance on drug use among younger and middle-aged individuals.

The relationship between education level and rational drug use revealed that bachelor’s degree and postgraduates demonstrated a higher level of rational drug use compared to other education levels. This emphasizes the impact of education on drug use and the importance of educational interventions for individuals with lower education levels.

No statistically significant relationship was found between the presence of chronic diseases and rational drug use. However, it is important to note that individuals with chronic diseases require more health services, making the proper management of drug use critical in this context.

A statistically significant correlation was identified between recommendations for drug use and rational drug use, with a higher rate of rational drug use (73.3%) being observed among those who followed recommendations. This highlights the critical role of healthcare professionals in providing proper guidance on drug use for public health.

Along with all this, this study comprehensively discusses the current situation and difficulties encountered regarding rational drug use in Türkiye. Research shows that both health officials and patients do not have sufficient knowledge and awareness about rational drug use, which leads to drug waste and incorrect drug use. The intense workload and time constraints of health officials, and patients' lack of knowledge and non-prescription drug use habits have been identified as the biggest obstacles to rational drug use. Research also emphasizes that pharmaceutical waste not only causes financial losses, but also has serious negative effects on the environment and health. Unnecessary drug use and incorrect disposal methods cause environmental pollution and increased antibiotic resistance. Strategies suggested to encourage rational drug use and reduce drug waste include increasing educational programs for healthcare professionals and patients, developing drug management and tracking systems, and implementing effective stock management practices. Awareness campaigns should be organized throughout society to ensure that people act more consciously and responsibly regarding drug use. In this context, rational drug use is of critical importance for human health and the environment. Therefore, both health authorities and the public need to be educated and raised awareness on this issue. In order to popularize rational drug use and prevent drug waste in Türkiye, health policies and practices need to be reviewed and effective strategies must be developed and implemented.

Based on the findings of the study, the following suggestions can be considered to shed light on future studies:

- Organizing awareness campaigns for all segments of society to encourage rational drug use, strengthening the training of health professionals and increasing access to accurate information about drug use are included.
- Additionally, improvements need to be made in prescribing and drug distribution processes to support rational drug use.
- Organizing customized education and awareness campaigns for different age groups and education levels.
- Collaborating with pharmaceutical companies to develop and distribute informative and educational materials on drug use. Encourage pharmaceutical companies to adhere to rational drug use principles in their marketing strategies.
- Health authorities should prepare guidelines on drug use and disseminate them widely among healthcare professionals and patients. These guidelines should provide information on proper drug use, dosage, and side effects.
- Establishing drug waste management programs to prevent incorrect and unnecessary drug use and raise public awareness about the proper disposal of drugs.
- Considering demographic factors such as age and gender in health service planning to improve drug use management.
- Utilizing digital health applications and mobile health technologies to inform and monitor individuals about drug use. These applications can support users with functions like medication reminders and dosage tracking.
- Pharmacists should play a more active role by providing counseling on rational drug use and informing patients. Distribute informational materials on drug use in pharmacies.
- Strengthening the family medicine system to facilitate access to health services and more effective drug use manage. Family doctors can provide continuous guidance on drug use through regular communication with patients.
- Enhancing general health literacy to enable individuals to make more informed decisions about drug use. Prepare educational programs and materials aimed at improving health literacy.
- Using media and social media platforms effectively to inform and educate the public about rational drug use. Reaching wide audiences through television programs, radio spots, and social media campaigns.

This study makes significant contributions to the literature on rational drug use by thoroughly analyzing the effects of various factors such as gender, age, education level, the presence of chronic diseases, and drug use recommendations. Additionally, it provides practical solutions for improving health policies and practices by offering several recommendations to promote rational drug use. Future research can examine how family physicians can encourage rational drug treatment more effectively by regularly monitoring patients.

DECLARATION OF THE AUTHORS

Declaration of Contribution Rate: The first author contributes 30%, the second author 25%, the third author 20%, the fourth author 15%, and the fifth author 10%.

Declaration of Support and Thanksgiving: No support is taken from any institution or organization.

Declaration of Conflict: There is no potential conflict of interest in the study.

REFERENCES

Ahmadiani, S., & Nikfar, S. (2016). Challenges of access to medicine and the responsibility of pharmaceutical companies: A legal perspective. *DARU J Pharmaceutical Sci, 24*(1), 13.

Altındiş, S. (2017). Akılcı ilaç kullanımına sistematik bir bakış. *Journal of BSHR, 1*(2), 34-38.

Arıkan, A.O., Öztürk, I., Demir, İ., & Macin, E., K. (2016). Medical waste management in Türkiye, *ICOFEST,* 1-8.

Aslan, Y., & Demir, K. (2023). A general evaluation of the reasons for medication wastage: A university hospital example. *Journal Of Health And Nursing Management.10*(1), 79-86.

Badur, İ., Badur, B., N., & Berk, B. (2022). Investigation of hidden crisis of prescription drug abuse in Türkiye: Pregabalin monitoring, *Acta Pharm. Sci. 60*(4), 1- 11.

Bayraktar, B., & Deniz, E., U. (2024). Rational drug use and community pharmacy. *Pharmata, 4*(1), 22-26.

Benlier, N., Şahin, B., Göğer, M. E., Sezal, E., Sankır, D., Pamukiçi, A. K., Songurtekin, B., Deniz, B., Ülgey, B., Caf, İ., Gürkan, F. S., Günayligil, T., & Soran, Ö. (2019). Rational drug use in geriatric patients in the country of Gaziantep. *Geriatric Bilimler Dergisi, 2*(2), 30-35.

Bhartiy, S. S., Shinde, M., Nandeshwar, S., & Tiwari, S. C. (2008). Pattern of prescribing practices in the Madhya Pradesh, India. *Kathmandu University Medical Journal, 6*(1), 55-59.

Blum, N. L. (2000). *Drug information development. A case study Nepal*. Rational pharmaceutical management project. United States Pharmacopoeia.

Cansever, H. İ., & Tüfekçi, N. (2020). Tarihsel süreçte Türkiye'de sağlık planlaması üzerine bir değerlendirme. *Süleyman Demirel Üniversitesi Vizyoner Dergisi*, *11*(27), 614-628.

Ceyhan, M. S., & Taş, C. (2017). Rasyonel- irrasyonel tüketim: Bartın örneğinde karşılaştırmalı bir uygulama. *Bartın Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 8*(16), 107-134.

Çalıkoğlu, E. O., Köyceğiz, E., Koşan, Z., & Aras, A. (2019). Rational drug use and prescribing behavior of family physicians in Erzurum, Türkiye, *Nigerian Journal of Clinical Practices*, *22*(5), 626-632

Çavdar, M., & Güç Suvak, Ö. (2023). Pandemi gölgesinde akılcı ilaç kullanımı ve sağlık okuyazarlığı ilişkisi: Kesitsel bir çalışma. *Hacettepe Sağlık İdaresi Dergisi, 26*(3), 655-666.

Çelik, E., Şencan, N. M., & Clark, P. M. (2013). Factors affecting rational drug use (RDU) compliance and wastage, *Turk J. Pharm Sci*. *10*(1), 15- 170

Deniz, S. (2019). Akılcı ilaç kullanımına ilişkin tutum ve davranışların belirlenmesine yönelik bir araştırma. *Hacettepe Sağlık İdaresi Dergisi,* 22(3), 619-632.

Doğan, M., & Saraç, B. (2020). Evaluation of the knowledge and opinions of university students in rational drug use. *Cumhuriyet Tıp Dergisi (Cumhuriyet Medical Journal)*, *42*(1), 49-55

Duman, İ., & Karadağ, S. (2024). Rational drug use in older adults and the ınfluencing factors: A cross-sectional study. *Geriatrik Bilimler Dergisi, 7*(2), 117-125. https://doi.org/10.47141/geriatrik.1506076.

Ekici, Ö. (2024). Evaluation of the knowledge and attitudes of dentists working in a university hospital in Afyonkarahisar regarding rational drug use. *Selçuk Dental Journal, 11*(1), 37-42. https://doi.org/10.15311/selcukdentj.1280511.

Gebramariam, E. T., & Ahmed, M. (2019). *Evaluation of rational medicine use based on WHO care drug use indicators in public hospitals in West Shoa Zone*. Oromia, Ethiopia.

Günel, M., & Demirtaş, A. (2024). Kronik hastalığa sahip genç ve yaşlı hastaların ilaç uyumu ve akılcı ilaç kullanım bilgi düzeylerinin incelenmesi, *Sağlık Akademisyenleri Dergisi, 11*(1), 82-92.

Mamo, D. B., & Alemu, B. K. (2020). Rational drug-use evaluation based on World Health Organization care-drug-use indicators in tertiary referral hospital, Northeast Ethiopia: A cross-sectional study. *Drug Healthcare and Patient Safety, 12*, 15-21. https://doi.org/10.2147/DHPS.S237021.

Mekonnen, B. D., Ayalew, M. Z., & Tegegn, A. A. (2021). *Rational drug use evaluation based on World Health Organization core drug use indicators in Ethiopia: A systematic review*.

Nyabuti, A. O., Okalebo, F. A. & Guantai, E. M. (2020). Examination of WHO/INRUD care drug use indıcators at public primary healthcare centers in Kisii country, Kenya. *Hindawi Advances in Pharmacological and Pharmaceutical Sciences, 7*, 1-5. https://doi.org/10.1155/2020/3173847.

Özçelikay, G. (2001). Akılcı ilaç kullanımı üzerinde bir pilot çalışma. *Ankara Ecz. Fakültesi Dergisi*, *30*(2), 9-18.

Özdamar, K. (2004). *Paket programlar ile istatistiksel veri analizi*. Kaan Kitabevi.

Özdamar, E. N., & Mutlu, H. H. (2021). Evaluation of the rational drug use by using the World Health Organization core prescribing indicators at the obesity outpatient clinic of a tertiary care hospital. *Ege Tıp Dergisi, 60*(1), 13-19.

Özdinç, S., Sensoy, N., Kurt, R., Altas, S. & Altun, R. (2015). Are we using drog rationally? A survey study from Türkiye. *Pakistan Journal of Medical Sciences*, *31*(5), 1156– 1161.

Öztürk, H., & Acar, F. (2021). Yükseköğretim öğrencilerinin akılcı ilaç kullanımına yönelik algı ve tutumlarının değerlendirilmesi: bir devlet üniversitesi örneği. *Uluslararası Sağlık Yönetimi ve Stratejileri Araştırma Dergisi, 7*(1), 32-46.

Sezer, A. T., Öztürk, A., Esenay, I. F., & Tezel, A. (2022). Rational use of medicines in primary school children in Türkiye: Attitudes and behaviors of parents, *International Journal of Caring Sciences*, *15*, 478 – 488.

Sema, F. D., Asres, E. D., & Wubeshet, B. D. (2021). Evaluation of rational use of medicinde using WHO/INRUD care drug use ındicators at teda and azezo health Centers, Gondar town, northwest Ethiopia. *Integrated Pharmacy Research and Practice, 10*, 51-63.

Sülük, N., & Erdem, R. (2018). Toplumun rasyonel ilaç kullanımları ile farmasötikalizasyon düzeylerinin değerlendirilmesi. *Süleyman Demirel Üniversitesi Vizyoner Dergisi*, *9*(21), 114-128. https://doi.org/10.21076/vizyoner.425908.

Şengül, B. N., & Akyıl, M. Ş. (2022). Farklı kuşaklarda akılcı ilaç kullanımı ve sağlık algısının incelenmesi. *Hemşirelik Bilim Dergisi, 5*(3), 169-178.

Tosun, N., & Hoşgör, H. (2021). E-sağlık okuryazarlığı ve akılcı ilaç kullanımı farkındalığı arasındaki ilişkinin belirlenmesine yönelik bir araştırma. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi, 22*(2), 82-102.

T. C. Ticaret Bakanlığı. (2018). *Tüketicinin Korunması ve Piyasa Gözetimi Genel Müdürlüğü, Türkiye israf raporu*. Retrieved November 30, 2024 from https://tuketici.ticaret.gov.tr/data/5e6b33e913b876e4200a0101/Turkiye_Israf_Raporu_2018.pdf

T. C. Sanayi ve Teknoloji Bakanlığı. (2020). *Sanayi ve Verimlilik Genel Müdürlüğü, ilaç sektörü raporu*. Retrieved November 30, 2024 from https://www.sanayi.gov.tr/assets/pdf/plan-program/IlacSektorRaporu(2020).pdf

Uçman, T., & Uysal, N. (2021). Yetişkin bireyler akılcı ilaç kullanımı ve etkileyen faktörlerin belirlenmesi. *Bandırma Onyedi Eylül Üniversitesi Sağlık Bilimleri ve Araştırmaları Dergisi, 3*(2), 126-133.

Wagner, A. K., Quick, J. D., Ross-Degnan, D. (2014). Quality use of medicines within universal health coverage: challenges and opportunities. *BMC Health Serv. Res.*, *14*(1), 1-6. https://doi.org/10.1186/1472-6963-14-357

WHO. (1985). *The rational use of drugs: Review of major issues*. Retrieved November 7, 2024 from https://apps.who.int/iris/bitstream/handle/10665/62311/WHO_CONRAD_WP_RI.pdf?sequence=1

WHO. (1987). *The rational use of drugs. Report of the conference of experts*. Nairobi, 25-29 November 1985. World Health Organization.

WHO. (1993). *How to ınvestigate drug use in health facilities: Selected drug use indicators*. Geneva.

WHO. (2002). *Promiting rational use of medicines: core components*. Geneva.

WHO. (2011). *The World medicines situation, rational use of medicines, 2011 who /EMP/ MIE/2011.22*. Available Retrieved November 30, 2024 from http://apps.who.int/medicinedocs/pdf/h3011e/h3011e.pdf

WHO. (2012). *The pursuit of responsible use of medicines; sharing and learning from country experiences*. Retrieved November 30, 2024 from https://iris.who.int/bitstream/handle/10665/75828/WHO_EMP_MAR_2012.3_eng.pdf?sequence=1

WHO. (2024). *Promoting rational use of medicines*. Retrieved November 30, 2024 from https://www.who.int/activities/promoting-rational-use-of-medicines

Yalçın, A. (2024). Reçeteli ilaç kullanımının rasyonelliğe etkisi kapsamında Avrupa Birliği ve Türkiye'nin Karşılaştırılması. *Enderun Dergisi, 8*(1), 41-54.

Yazıcıoğlu, Y., & Erdoğan, S. (2004). *SPSS uygulamalı bilimsel araştırma yöntemleri*. Detay Yayıncılık

Yılmaz, M., Kırbıyıkoğlu, F. İ., Ariç, Z., & Kurşun, B. (2014). Bir diş hekimliği fakültesi hastanesine başvuran bireylerin akılcı ilaç kullanımlarının belirlenmesi. *Erciyes Üniversitesi Sağlık Bilimleri Fakültesi Dergisi, 2*(1), 39-47.

Yılmaztürk, A. (2013). Türkiye'de ve Dünyada akılcı ilaç kullanımı. *Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 2*(2), 42-49.