

## Research Article

# Attitudes and behaviors of individuals aged 90 and over towards rational use of drugs: cross-sectional research

90 yaş ve üzeri bireylerin akılcı ilaç kullanımına yönelik tutum ve davranışları: kesitsel araştırma

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## Abstract

**Introduction:** The current study was aimed to evaluate the attitudes and behaviors of individuals 90 years and older living in Malatya regarding rational drug use.

**Methods:** This cross-sectional, descriptive study was carried out with people aged 90 and over (n=1022) living in Malatya province and its districts. Face-to-face interview method was used to collect study data. In the first part of the form used for data collection, the descriptive characteristics of the participants were questioned, and in the second part, the attitudes and behaviors towards rational drug use were examined. Rational drug use features are evaluated by World Health Organization (WHO) prescribing indicators.

**Results:** The frequency of rational drug use was 84.1%, and the rate of over-the-counter drug use was 19.2% among individuals 90 years and older. 52.3% of the participants had over-the-counter medication at home for use, when necessary, without doctor's recommendation. The most commonly available over-the-counter group of drugs at home were painkillers.

**Conclusion:** The frequency of rational drug use in individuals aged 90 and older has been determined higher than in the literature on individuals aged 65 and older. Education, guidance and counseling programs can be created to increase rational drug use within elderly people communities.

**Keywords:** rational drug use; oldest-old; elderly; attitude; behavior

## Öz


**Giriş:** Mevcut çalışma, Malatya il ve ilçelerinde yaşayan 90 yaş ve üzeri bireylerin akılcı ilaç kullanımı ile ilgili tutum ve davranışlarını incelemektir.

**Yöntem:** Kesitsel tipte, tanımlayıcı nitelikte olan bu araştırma, Malatya il ve ilçelerinde yaşayan 90 yaş ve üzeri kişilerle (n=1022) yapılmıştır. Veriler yüz yüze görüşme yöntemiyle toplanmıştır. Verilerin toplanmasında kullanılan formun birinci bölümünde katılımcıların tanımlayıcı özellikleri, ikinci bölümünde akılcı ilaç kullanımına yönelik tutum ve davranışları sorgulanmıştır. Akılcı ilaç kullanım özellikleri Dünya Sağlık Örgütü'nün (DSÖ) tanımlayıcı belirteçlerine göre değerlendirildi.

**Bulgular:** Araştırmada 90 yaş ve üzeri bireylerde akılcı ilaç kullanım sıklığı %84,1, reçetesiz ilaç kullanma oranı %19,2 olarak bulunmuştur. Katılımcıların %52,3'ünün evde doktor önerisi dışında gerektiğinde kullanmak üzere reçetesiz ilaç bulundurduğu ortaya çıkmıştır. Evde en fazla reçetesiz bulundurulmuş ilaç grubu ağrı kesiciler olmuştur.

**Sonuç:** 90 yaş ve üzeri bireylerde akılcı ilaç kullanım sıklığı literatürdeki 65 yaş ve üzeri bireyler üzerinde yapılan çalışmalara göre daha yüksekti. İleri yaşlı bireylerde akılcı ilaç kullanımını arttırmaya yönelik eğitim, rehberlik ve danışmanlık programları oluşturulabilir.

**Anahtar kelimeler:** akılcı ilaç kullanımı; ileri yaşlı; yaşlı; tutum; davranış

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## Key Points

1. The frequency of rational drug use was 84.1%, and the rate of over-the-counter drug use was 19.2% among individuals 90 years and older.
2. 52.3% of the participants had over-the-counter medication at home for use, when necessary, without doctor's recommendation.
3. The most commonly available over-the-counter group of drugs at home were painkillers.

## Introduction

Rational drug use is defined as "to reach an effective and reliable drug suitable for the individual characteristics of people at a price that they can afford and to use it at the appropriate time and dose"[1]. According to the World Health Organization, more than half of the drugs around the world are prescribed, distributed, and sold inappropriately. Therefore, the majority of patients cannot take medications properly [2]. Inappropriate drug spending has a serious burden on the world economy, especially in developing countries such as Turkey. The most significant element affecting the productivity of health systems is drug use. While pharmaceutical expenditures account for more than a fifth of all health expenditures in the world, this figure is over 25% in Turkey [3,4]. Irrational drug use does harm society not only by causing an increase in treatment costs and waste of current resources. It also causes recurrence of diseases, treatment failure, deterioration of treatment adaptation process, development of tolerance to drugs, the occurrence of adverse events, development of antimicrobial resistance, undesirable drug interactions, and high incidence of toxicity [5,6].

Old age and aging are the demographic phenomena that are becoming increasingly important for the whole world and Turkey. World Health Organization defines the ages of 65-74 as old age, 75-84 as very old age, and 85+ as elderly old age. In Turkey, while the ratio of the old-aged population to the total population was 8.2% in 2015, it increased to 9.5% in 2020. This rate is expected to increase to 16.3% in 2040 [7]. In 2021, this figure was 0.024% for individuals aged 90 years and over. With aging, organ functions decrease, and the number of chronic diseases increases. This condition can cause the use of multiple drugs. With aging, the pharmacokinetic and pharmacodynamic features of medications change, and cognitive problems and polypharmacy are observed more often. All these reasons make elderly people more prone to drug intoxication. They cause an increased risk of morbidity and mortality due to the use of drugs [8,9]. Because 30% of prescribed drugs are used by elderly people, the concept of rational drug use becomes more important in old age [8]. There is insufficient data on the attitudes and behaviors of people aged 90 and over towards rational drug use in Turkey. The purpose of this study is to examine the attitudes and behaviors of people aged 90 and over towards rational drug use.

## Methods

This study was planned as a cross-sectional identifier concerning time to examine the attitudes and behaviors of people aged 90 and over registered to the Family Health Centers in the Malatya province and its districts towards rational drug use between April and July 2019. In the study, no sampling methods were used, and it was aimed to reach the total population (n=1114). The study was conducted with the participation of those accepted to participate in the study who have no communication problems and dementia (n=1022). Among those with hearing, vision, and perception problems, those who were not able to answer the questions for whatever reason were excluded from the study.

The independent variables of the study consist of sociodemographic features of the participants (age, gender, educational status, marital status, economic status, and social security). The dependent variables of the study are the attitudes of people aged 90 and over towards rational drug use.

The questionnaire form, created by the researchers by scanning the literature, was used to collect data in the study. This questionnaire consisted of sociodemographic features (age, gender, educational status, marital status, economic status, and social security) and questions related to the evaluation of rational drug use. In the study, rational drug use was defined as using drugs in the amount and time recommended by the doctor similar to the definition of the World Health Organization [10]. Answering both questions as "yes" was considered rational drug use [10]. Data were collected through face-to-face interview methods with home visits. The data collection process took approximately 20 minutes for each participant.

## Ethical approval

The study was approved by the Ethics Committee of Inonu University Non-Interventional Clinical Research Ethics Committee (on 19.02.2019 with the number 2019/4-20). At all stages of the research, the Helsinki Declaration Principles, Research, and Publication Ethics were complied with.

## Statistical analysis

Study data was evaluated with SPSS 26 (SPSS Inc., Chicago, IL, USA) v26 statistical package program. Study data was presented as frequency and percentages for categorical variables, mean (standard deviation) for normally distributed continuous variables, and median (min-max) for non-normally distributed data. The distribution of the data was determined using the Kolmogorov-Smirnov and Shapiro Wilk test. Pearson Chi-square test was used in the analysis of categorical data. Mann Whitney U test was used for non-normally distributed continuous variables in two independent groups.  $p < 0.05$  was considered statistically significant.

## Results

The mean age of the people participating in the study was  $93.66 \pm 3.57$  (90-106). Sociodemographic features of people participating in the study are given in Table 1. 76.4% of the participants were female. 69.7% of the participants were between the age of 90 and 94, and 70.3% were single. And when we categorized the participants based on their educational status, 83.0% of them were illiterate. 33.4% of the people participating in the study described their economic situation as bad, while 90.7% had social security.

Participants' attitudes and behaviors towards rational drug use showed in Table 2. 19.2% of the participants stated that they use medication without a doctor's recommendation, and the majority of them said that this is because those drugs were good for them before. 88.8% of the participants stated that they do not recommend the medications good for them to anybody else, 84.1% stated that they use the drugs in the amount that the doctor recommended, and 84.5% stated that they use the drugs within the time recommended by the doctor. The rate of rational drug use in the study was 81.7%. 72.3% of the participants do not pay attention to the expiration dates of the drugs, and 73.0% do not read the instructions for using the drugs. When participants were asked if they would like the doctor to prescribe additional medications in addition to the prescription,

16.9% answered yes. 52.3% of the participants had drugs at home to use when needed other than the doctor's recommendation, while the most commonly available drug at home was painkillers. (Table 2)

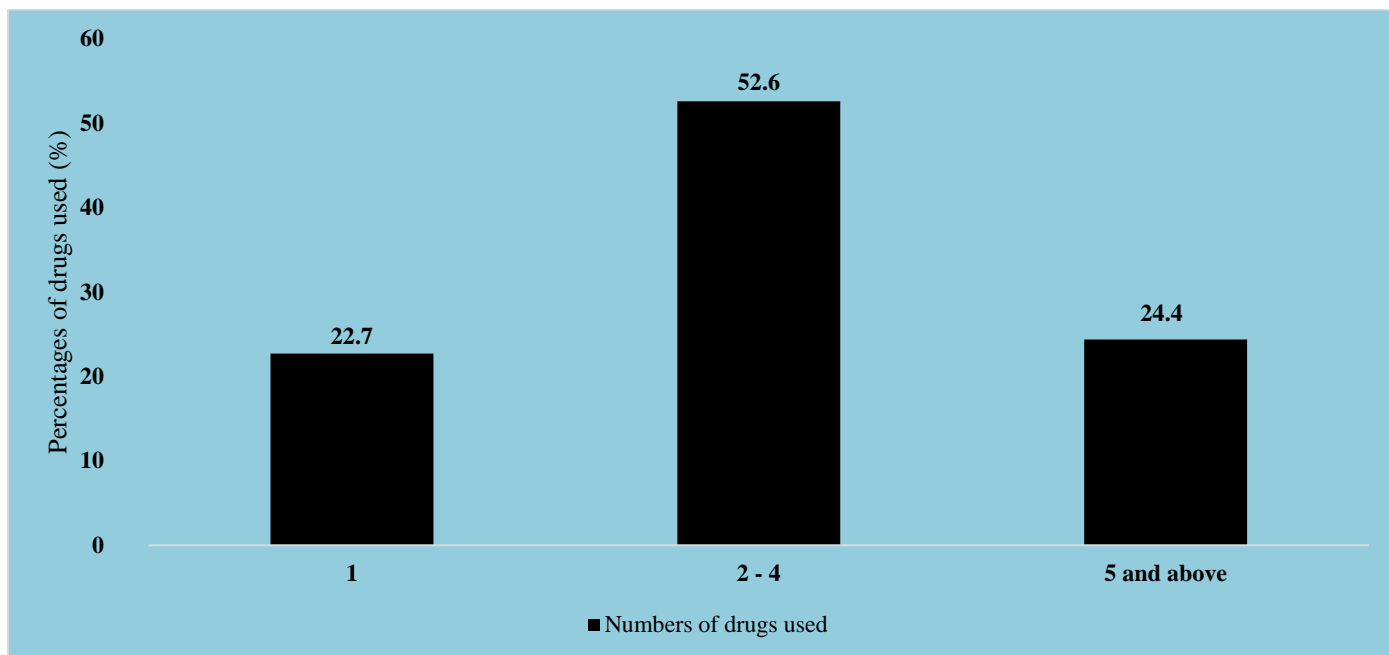
**Table 1.** Sociodemographic features of participants (n=1022)

Variables	n	%
<b>Gender</b>		
Female	781	76.4
Male	241	23.6
<b>Age groups</b>		
90-94	712	69.7
95-99	231	22.6
≥100	79	7.7
<b>Marital status</b>		
Married	304	29.7
Single	718	70.3
<b>Education</b>		
Illiterate	848	83.0
Literate	87	8.5
Primary school and above	87	8.5
<b>Social security</b>		
None	95	9.3
Available	927	90.7
<b>Economic Status</b>		
Bad	341	33.4
Middle- Well	681	66.6

**Table 2.** Behaviors and attitudes of participants towards rational drug use

Behaviors and attitudes of participants towards rational drug use	n	%
<b>Do you use drugs without the recommendation of a doctor? (n=1022)</b>		
Yes	196	19.2
No	826	80.8
<b>If you are using the medicine without a doctor's recommendation, what/whose recommendation do you use? (n=196)</b>		
Pharmacist recommendation	17	8.7
Recommendation of friends/relatives	35	17.8
Because it was good before	111	56.6
other	33	6.9
<b>Do you recommend a drug that is good for you to someone else? (n=978)</b>		
Yes	70	7.1
No	908	92.9
<b>Do you use the drugs in the amount recommended by the doctor? (n=1022)</b>		
Yes	859	84.1
No	163	15.9
<b>Do you use the drugs in the times recommended by the doctor? (n=1022)</b>		
Yes	864	84.5
No	158	15.5
<b>Do you pay attention to the expiration dates of the drugs? (n=1022)</b>		
Yes	283	27.7
No	739	72.3
<b>Do you read the prospectus of drugs? (n=863)</b>		
Yes	221	25.6
No	642	74.4
<b>Do you ask your doctor to prescribe additional drugs in addition to the prescription? (n=1022)</b>		
Yes	173	16.9
No	849	83.1
<b>Do you have any drugs at home to use when you need them? (Other than doctor's recommendations) (n=1022)</b>		
Yes	534	52.3
No	488	47.8
<b>If your answer to the previous question is yes, what drugs do you have at home? (n=534)</b>		
Painkillers	310	58.0
Cold/flu medications	11	2.0
Stomach medications	12	2.2
other	201	37.8

The number of medications that the participants had to use on a daily basis is shown in Figure 1. 52.6% of the participants were using 2-4 drugs daily (Figure 1).



**Figure 1.** The number of drugs used by the participants continuously.

All the participants in the study had at least one chronic disease. The rate of rational drug use in the participants was 81.7%. The median of chronic diseases and the median of drugs participants use continuously according to the participants' rational drug use situations presented in Table 3. While the number of number of drugs used was lower in the group with rational drug use (p=0.001), there was no significant difference between te number of chronic diseases and ratrional drug use (p=0.064, Table 3).

**Table 3.** Distribution of the number of chronic diseases and the number of drugs used continuously according to rational drug use (n=1022)

	The number of drugs used continuously. (Median(Q1-Q3))	The number of chronic diseases (Median(Q1-Q3))
<b>Irrational drug use</b>	5.0(3.0-5.0)	2.0(2.0-4.0)
<b>Rational drug use</b>	4.0(4.0-5.0)	3.0(2.0-4.0)
p*	<b>0.001*</b>	0.064*

\*Mann Whitney U test , Q1-Q3; interquartiles(%25-%75)

The findings regarding the relationships between sociodemographic features and rational drug use behaviors of the participants are presented in Table 4. In Table 4, a significant statistical difference was found between the age groups regarding "using drugs without the recommendation of a doctor", which is one of the attitudes related to rational drug use. The rate of using drugs without a doctor's recommendation was higher in the 90-94 age group than in those aged 95 and over (p=0.031). The behavior of asking the doctor to prescribe additional drugs in addition to the prescription was more common in female participants (p= 0.004) in the literate group (p= 0.008). (Table 4)

**Table 4.** Comparison of behaviors and attitudes towards rational drug use according to demographic features

Demographic features	Do you use drugs without the recommendation of a doctor?		Do you use drugs in the amount your doctor recommended?		Do you use drugs in the times your doctor recommended?		Do you ask your doctor to prescribe additional drugs in addition to prescription?	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
<b>Gender</b>								
Female	151 (19.3)	630 (84.1)	657 (84.1)	124 (15.9)	661 (84.6)	120 (15.4)	147 (18.8)	634 (81.2)
Male	45 (18.7)	196 (81.3)	202 (83.8)	39 (16.2)	203 (84.2)	38 (15.8)	26 (10.8)	215 (89.2)
<b>p*</b>		0.820		0.820		0.880		<b>0.004</b>
<b>Age</b>								
Between 90-94	149 (20.9)	563 (79.1)	603 (84.7)	109 (15.3)	600 (84.3)	112 (15.7)	126 (17.7)	586 (82.3)
95 and over	47 (15.2)	263 (84.8)	256 (82.6)	54 (17.4)	264 (85.2)	46 (14.8)	47 (15.2)	263 (84.8)
<b>p*</b>		<b>0.031</b>		0.397		0.717		0.320
<b>Marital status</b>								
Married	52 (17.1)	252 (82.9)	250 (82.2)	54 (17.8)	262 (86.2)	42 (13.8)	48(15.8)	256(84.2)
Single	144 (20.1)	574 (79.9)	609 (84.8)	109 (15.2)	602 (83.8)	116 (16.2)	125(17.4)	593(82.6)
<b>p*</b>		0.273		0.302		0.344		0.528
<b>Education</b>								
Illiterate	164 (19.3)	684 (80.7)	706 (83.3)	142 (16.7)	715(84.3)	133(15.7)	156(18.4)	692(81.6)
Literate	16 (18.4)	71 (81.6)	75 (86.2)	12 (13.8)	73(83.9)	14(16.1)	5(5.7)	82(94.3)
Primary school and above	16 (18.4)	71 (81.6)	78 (83.3)	9 (86.2)	76(87.4)	11(12.6)	12(13.8)	75(86.2)
<b>p*</b>		0.273		0.254		0.254		<b>0.008</b>
<b>Social Security</b>								
Available	17 (17.9)	78 (82.1)	77 (81.1)	18 (18.9)	77 (81.1)	18 (18.9)	11 (11.6)	84 (88.4)
None	179 (19.3)	748 (80.7)	782 (84.4)	145 (15.6)	787 (84.9)	140 (15.1)	162 (17.5)	765 (82.5)
<b>p*</b>		0.738		0.402		0.324		0.144
<b>Economic status</b>								
Bad	70 (20.5)	271 (79.5)	277 (81.2)	64 (18.8)	278 (81.5)	63 (18.5)	49 (14.4)	292 (85.6)
Middle-Well	126 (18.5)	555 (81.5)	582 (85.5)	99 (14.5)	586 (86.0)	95 (14.0)	124 (18.2)	557 (81.8)
<b>p*</b>		0.408		0.082		0.059		0.123

\* Pearson's chi-squared test

## Discussion

Polypharmacy is an important public health problem that increases in prevalence with advancing age. In this study, the number of drugs that 24.4% of the participants used continuously was 5 or more. Although there is no similar study conducted on the elderly population aged 90 years and over, Yilmazel et al. reports the polypharmacy rate in individuals over the age of 65 as 53%, Aslan et al. as 49.1% [11]. Even though the average age of the people participating in this study was higher than in the other studies in the literature, the polypharmacy rate was lower.

Rational drug use has three components. These are the society, the health staff and pharmaceutical industry, and the institutions regulating and auditing the drug policies [12,13]. The prerequisite of rational drug use is to use the drug in the amount and time recommended by the doctor. Premature discontinuation of a drug due to the disappearance of the symptoms can lead to undesirable medical consequences. In this study, 15.9% of the participants did not use the drugs in the amounts recommended by the doctor and 15.5% did not use the drugs at the times recommended by the doctor. Kasar and Karadakovan reported that 6.7% of elderly people take their medication in the wrong amount [14]. In the study conducted by Dagtekin et al. to determine the behaviors and attitudes of adults aged 18-87 towards rational drug use, the group with the highest percentage of rational drug use was those aged 65 and over (%54.4), while the lowest was those aged between 18 and 39 (%41.1) [14]. In our study, in which the average age was much higher, this rate was 81.7%. It is reported in the literature that irrational drug use behavior increases at a young age and as the level of education increases [15].

The use of prescription or non-prescription drugs due to chronic diseases is more common in the elderly population [16]. In this study, While the number of number of drugs used was lower in the group with rational drug use, no significant difference was found in the number of chronic diseases.

There are a lot of drugs that remain unused and residual due to the irrational use of drugs. Apart from the economic aspect of residual drugs, it can also be said that they pose a risk of drug poisoning [17]. In their study, Dolu and Bilgili stated that 81% of elderly people paid attention to the expiration dates of the drugs [18]. In our study, 72.3% of the participants did not pay attention to the expiration dates of drugs, while 73.0% did not read the prospectus. This situation can be explained by the fact that the literacy rate in our study was low. The use of drugs without a doctor's recommendation is a common behavior in both developed and developing countries. The global sale of non-prescription drugs accounts for about 17% of the total sale of drugs worldwide [19]. In this study, 19.2% of the participants took medication without a doctor's recommendation, and the majority attribute the reason for this to the fact that those drugs were good for them before. This rate is 76.0% in the study of Hatipoglu et al., and 88.1% in the study of Ucman et al.[20,21]. The average age of the sample of both studies was lower than the average age in our study. While Akkus and Karatay stated that 28.9% of elderly people recommended the drugs good for them to their friends [22]. Akkoca et al. stated that all elderly people sometimes recommended drugs to their environment [24]. In our study, this rate was 6.8% and it was very low compared to the literature.

According to the literature, more than half of people have drugs at home to use when necessary. The most common drugs stocked at home are painkillers [15,24]. The findings of our study were in compliance with the literature. The fact that patients ask the doctor for additional drugs in addition to the prescription threatens people's health by causing unnecessary drug use. In their study, Dagtekin et al. stated that 31.6% of the participants asked the doctor for additional drugs in addition to the prescription [10]. This rate was 16.9% in our study and this rate was higher in female and illiterate participants.

## Limitations

Research those who live in only one province throughout the country there is a problem of generalization of research results due to its inclusion.

## Conclusion

In our study, which was conducted with mostly illiterate people due to their average age, the rate of rational drug use was much higher than in similar studies. Increasing social awareness regarding rational drug use will not only increase the treatment success but also enable the effective usage of financial resources and the effective provision of health services. Nowadays, it is extremely easy to access health information yet accessing the right health information is difficult. This situation shows us the need to increase the level of education in society, as well as health literacy.

**Conflict of interest:** None

Author Contributions		Author Initials
SCD	Study Conception and Design	NK, RB, SD
AD	Acquisition of Data	NK, RB, SD
AID	Analysis and Interpretation of Data	NK, RB, SD
DM	Drafting of Manuscript	NK, RB, SD
CR	Critical Revision	NK, RB, SD

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