Assessment of rational use of drugs and self-medication in Turkey: A pilot study from Elazıg and its suburbs

Tufan Nayir[1], Ramazan Azim Okyay[2], Hakki Yesilyurt[3], Muhsin Akbaba[4], Ersin Nazlıcan[4], Yasemin Acık[5] and Halil Ibrahim Akkus[6]

[1]Mersin Public Health Directorate, Mersin, Turkey
[2]Adana Public Health Directorate, Adana, Turkey
[3]Ministry of Health, Undersecretary, Ankara, Turkey
[4]Cukurova University Faculty of Medicine, Department of Public Health, Adana, Turkey
[5]Fırat University Faculty of Medicine, Department of Public Health, Elazığ, Turkey
[6]Elazığ Public Health Directorate, Elazığ, Turkey

Abstract: The concepts of "essential drugs" and "national drug policy" described by the World Health Assembly in 1975 were the first steps taken towards the rational use of drugs (RUD). According to WHO, more than half of all medicines worldwide are prescribed, dispensed or sold inappropriately and half of the patients fail to take them appropriately. The aim of this study has been to evaluate the habits of patients related to RUD with a specific aim to investigate the factors associated with self-medication. This descriptive survey study was carried out in Elazıg, located at the Southeastern region of Turkey. A Rational Usage of Drug Questionnaire", querying the socio-demographic characteristics, health status, knowledge and manners of people with respect to rational drug use and insensible consumption of over the counter (OTC) drugs was applied to a total of 3521 patients during 19.09.2014 to 26.09.2014.The number of females and males were almost equal and the majority were in the range of 25-45 years of age. It was found that 58.9% of patients were practising some form of self-medication, 29.4% of the patients were reported using antibiotics without prescriptionand55.5% of them discontinued antibiotherapy. Self-medication was found to be more common among males, more educated patients and less frequent among patients under 18 years and over 65 years of age and patients with a chronic disease. Patient awareness about RUD is inadequate in Turkey as in many countries. Considering the high rates of haphazard use of drugs, drug usage without prescription, i.e. OTC drugs, should be discouraged. It is possible to take significant steps towards increasing awareness in terms of RUD with the cooperation of physicians, health organizations, educational institutions, non-governmental organizations and media. Might then be possible to achieve the expected benefits of the drugs.

Keywords: Rational use of drugs; Self medication; Pharmacoepidemiology; Turkey.

INTRODUCTION

Drugs are an essential part of health care in terms of reducing mortality and morbidity from various diseases on the other hand they can cause negative health effects when used improperly (Pınar *et al.,* 2013). The concepts of "essential drugs" and "national drug policy" described by the World Health Assembly in 1975 were the first steps taken towards the rational use of drugs (RUD) (World Health Organization, 1975). In 1985, during The Conference of Experts on Rational Use of Drugs in Nairobi, convened by the World Health Organization (WHO), the modern definition of rational use of medicines was stated as "Rational use of medicines require that patients receive medications based on their clinical needs, in doses that meet their requirements, for an adequate period of time and at the lowest possible cost for patients and their community" (World Health Organization, 1987).

**Corresponding author:* e-mail: razim01@gmail.com

According to WHO, more than half of all medicines worldwide are prescribed, dispensed or sold inappropriately and half of patients fail to take them correctly (World Health Organization, 2007). All over the world, irrational use of drugs is a serious problem and holds a significant proportion of health expenditure. In developing countries including Turkey, unnecessary drug use emerges as a heavy burden to the country's economy (Karataş *et al.,* 2012). Among OECD countries Turkey is located at the end of the list with 6.6% in terms of the ratio of the gross national product allocated to drug expenditure. However in terms of the ratio of drug expenditure to total health expenditure Turkey is located at the beginning of the list with 24.8% (Özkan *et al.,* 2005).

There are many reasons to promote RUD such as concerns about health and economy, still most of the responsibility belongs to physicians (Karataş *et al.,* 2012; Özkan *et al.,* 2005). Rational prescribing procedure can be explained as a six-phase approach: physicians should assess and define the patient's problem distinctly; define the therapeutic aim; select the proper drug therapy; start

therapy with suitable details and consider nonpharmacologic alternatives; Give information, instructions, and warnings and assess therapy systematically. However physicians' efforts towards rational drug use alone are not sufficient; this should be supported by patient participation (Basaran and Akici, 2012).

It is known that self-medication with analgesics and antibiotics is frequent among patients. Improper use of analgesics is potentially dangerous to health, since these drugs have toxic and harmful side effects. The other most commonly observed mode of irrational drug use around the world is self-medication with antibiotics. Inappropriate antibiotic use for the treatment of infections creates problems in terms of both treatment costs and development of drug resistance by bacteria (Pınar *et al.,* 2013).

Based on this information, the purpose of this study is to evaluate the habits of patients related to RUD with a specific aim to investigate the factors associated with self-medication in Elazıg, located at the Southeastern region of Turkey.

METHODS

Study design

This descriptive study aiming to investigate the drug use habits of the patients, was held with the participation of Public Health Directorate, General Secretariat of The Association of Public Hospitals, Provincial Health Directorate and The Chamber of Pharmacists in Elazıg, a city in the Southeastern Anatolia with a population of 568,000 people (Turkish Statistical Institute, 2014).

In the study a "Rational Usage of Drug Questionnaire", which based on 25 questions was used. The first 5 questions pertain to the socio-demographic characteristics while the rest of the questions were related to health status, knowledge and manners of people with respect to rational drug use, and insensible consumption of procured over the counter (OTC) drugs.

Sample size

A similar study conducted in Adana, Turkey reported the prevalence of self-medication to be 57.3%. (Pınar *et al.,* 2013) In Elazıg with 568,000 inhabitants, the sample size was calculated to be 4032 people based on self-medication prevalence of 57.3% in 99% confidence interval and assuming 2% margin of error using the Epi Info program.

Before starting the study the questionnaires were pre-tested through a preliminary study and dysfunctional questions were corrected. The sample was distributed according to population density of counties and city center with simple random method; 479 people refused to participate in the survey due to time constraint or reluctance. A total of 87.3% of the targeted sample (3521 people) was reached out.

Data collection

Representatives from The Chamber of Pharmacists provided the distribution of questionnaires to family health centers, public & private hospitals and pharmacies located in provinces and districts. The representatives were also responsible for controlling whether the questionnaires were responded correctly. Data collection period was eight days during 19.09.2014 to 26.09.2014. At the end of this period, a total of 3521 patients responded to the questionnaires (face to face method).

Statistical analysis

Data management and computations of descriptive statistics of the survey were performed using SPSS for Windows software. (SPSS, Chicago, IL) Pearson chi-square test and a final backward stepwise logistic regression analysis was applied to assess the results. The level of statistical significance was accepted as $p<0.05$.

Ethical considerations

Verbal informed consent was obtained from all the participants and participation in the study was purely voluntary. Necessary authorization regarding the survey was obtained from the Health Administration.

RESULTS

The number of patients agreeing to participate in the study was 3251. The number of females and males were almost equal and the majority was in the range of 25-45 years of age; 61.3% (2157/3521) of the patients were educated at level of high school or higher; 60.4% (2125/3521) of the patients were married. The details about sociodemographic characteristics of patients are presented in table 1.

It was found that 24.1% (848/3521) of the patients had chronic diseases. The most common chronic diseases included: hypertension 26.1% (221/848), diabetes 20.0% (170/848), and cardiovascular diseases 14.0% (119/848). The rate of patients using medicines daily was 23.8% (840/3521); 73.2% (615/840) of them were suffering from at least one chronic disease. It is interesting that 26.8% (225/840) people were using medicines on daily basis without even suffering from any chronic disease.

It was revealed that65.8% (2316/3521) of the patients visited a physician when they felt sick and only 41.1% (1448/3521) of patients reported to have never bought medicines without a prescription, meaning, thereby 58.9% (2073/3521) of patients practised some form of self medication; 34.3% (1207/3521) of the patients reported that they procured medicines after prescription but with

out being sick or bought and kept at home in case they were needed. The most common medicines (these patients had got prescribed or bought in order to keep at home) were analgesics by 35.8% (432/1207), antibiotics by 13.6% (164/1207) and cold remedies by 16.7% (202/1207). It was found that55.5% (1918/3521) of the patients discontinued the antibiotic medication (without using the entire box contents) and 29.4% (1035/3521) of the patients reported using antibiotics without prescription. Reasons pertaining to patients' using antibiotics without a prescription are presented in fig. 1.

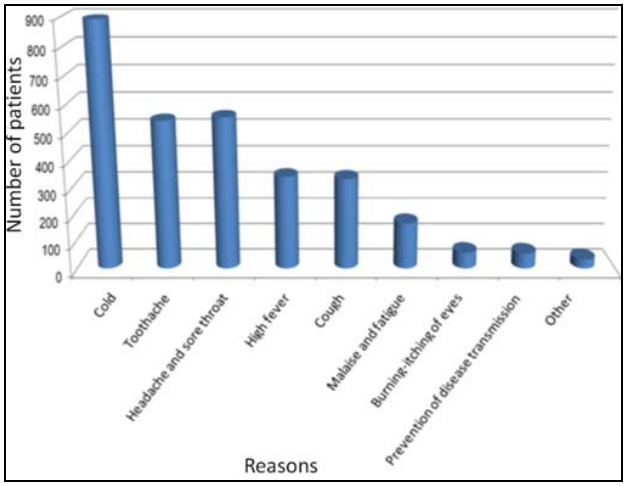

Fig. 1: Reasons for patients using antibiotics without prescription

It appeared that 44.4% (1565/3521) of the patients had 1 to 5 boxes of unused or unfinished drugs at their residences and 37.5% (1321/3521) of the patients discarded 1 to 3 boxes of drugs within a year even without opening the box, as the expiry date had already lapsed.

It was also found that 46.0% (1620/3521) of the patients declared that they were familiar with rational drug use" and "rational use of antibiotics" before. The details of patients' drug in taking habits are presented in table 2.

In the questionnaire, the key question regarding "self medication" was "Do you buy medicines from pharmacy without prescription?" Therefore, patients' answers to this question were evaluated according to the sociodemographic characteristics of the patients. Significant difference was found among genders (p=0.019), different educational backgrounds (p=0.0001), age groups (p=0.0001) and suffering from chronic diseases (p=0.015) in terms of self-medication. No significant difference was found with marital status (p=0.850). The details of patients' self medication habits according to sociodemographic characteristics are presented in table 3.

A final backward stepwise logistic regression analysis was performed to asses the factors affecting self medication. The variables that were independently and significantly associated with a greater probability of self-medication were: gender, with men having a 1.19-fold higher probability of practising self-medication than do women (OR=1.19, 95%CI: 1.03-1.37); education and age. Factors affecting self-medication are presented in table 4.

Table 1: The sociodemographic characteristics of the participants

Sociodemographic Characteristics	N	%
Gender		
Female	1704	48.4
Male	1817	51.6
Education		
Illiterate	242	6.9
Literate	265	7.5
Primary school education	819	23.3
High school education	1081	30.7
University education	1076	30.6
Other	38	1.0
Age group (years)		
Under 18	271	7.7
18-25	647	18.4
25-35	964	27.4
35-45	743	21.1
45-65	651	18.4
Over 65	245	7.0
Marital status		
Married	2125	60.4
Single	1146	32.5
Divorcee or widow	250	7.1

DISCUSSION

The purpose of this study has been to evaluate the habits of patients related to RUD with a specific aim to investigate the factors associated with self-medication in Elazıg, located at the Southeastern region of Turkey. To the best of our knowledge, this study is by far with the largest sample size related to the RUD conducted in Turkey. Although the study is only carried out on the applicants to health institutions, it is thought to provide important inputs about drug use behaviors of patients, since all health institutions in the province are covered.

It is found that 65.8% of the patients visited a physician when they felt sick. However 9.1% declared they were using medicines they had at home or borrowing from a relative in case of an illness. In another study carried out by Pınar *et al.* (2013), the rate of drug use upon the advice of relatives, friends was 14.9%. This indicates that close relatives have a significant cross impact on drug intake habits.

Table 2: The drug use habits of the patients

Questions	N	%
How often do you use medicines?		
Every day	840	23.8
A few times in a week	387	11.0
A few times in a month	985	28.0
A few times in a year	1309	37.2
What do you do when you feel sick?		
I visit a physician	2316	65.8
I use the medicines I have at home or borrow from a relative	320	9.1
I buy medicines from the pharmacy	298	8.5
I do not use any medicines, I wait to get well	587	16.6
Do you buy medicines from pharmacy without prescription?		
Never	1448	41.1
Yes, sometimes	1775	50.4
Yes, often	222	6.3
Yes, always	76	2.2
Do you have medicines prescribed without being sick or buy and keep at home in case of need?		
Yes	1207	34.3
No	2314	65.7
How long do you use the antibiotics prescribed for you?		
I quit when i feel recovered	1398	39.7
I do not use if the taste is bad	125	3.6
2-3 days	395	11.2
I use the entire box	1603	45.5
Do you use antibiotics without prescription?		
Yes	1035	29.4
No	2486	70.6
How many boxes of drugs do you have unused or unfinished in your house?		
None	1136	32.3
1-5	1565	44.4
6-10	488	13.9
More than 10	332	9.4
Over a year, how many boxes of drugs are thrown away even without opening the box, since the expiry date has lapsed?		
1-3	1321	37.5
4-7	495	14.1
8-10	252	7.1
More than 10	179	5.1
None	1274	36.2
Have you heard the expression of rational drug use and rational use of antibiotics before?		
Yes	1620	46.0
No	1901	54.0

In our study 58.9% of patients reported to use medicines without a prescription. Consistent to our findings, in similar studies conducted regarding drug use in Iran and Greece, the rate of self-medication was found to be 50-60% (Foroutan B and Foroutan R, 2014; Papakosta *et al.,* 2014). Self-medication was found to be more common among males in this study. However this data based study has gone controversial in the literature. Although there are studies in line with our study (Shankar *et al.,* 2002; Martins *et al.,* 2002), there are also contradicting data showing that females self-medicate more often than males (Papakosta *et al.,* 2014; Carrasco-Garrido *et al.,* 2008). The diversities in these studies are thought to be due to the differences in the methodologies/approaches.

It was found that university graduates have 1.60-fold higher probability of opting for self-medication. This finding is in accordance with studies conducted by other researchers; individuals with higher education have more knowledge about medications as compared to the less educated and hence may be feeling more competent for self medication (Foroutan B and Foroutan R 2014; Carrasco-Garrido *et al.,* 2008; Garofalo *et al.,* 2015).

Table 3: Self-medication habits of patients according to sociodemographic characteristics

Sociodemographic characteristics	***Self medication***				**χ2 and p values**
	Yes		No		
	N	%*	N	%*	
Gender					
Female	969	56.9	735	43.1	5.505 0.019
Male	1104	60.8	713	39.2	
Education					
Illiterate	119	49.2	123	50.8	48.960 0.0001
Literate	162	61.1	103	38.9	
Primary school education	425	51.9	394	48.1	
High school education	638	59.0	443	41.0	
University education	709	65.9	367	34.1	
Other	20	52.6	18	47.4	
Age groups (years)					
Under 18	147	54.2	124	45.8	29.847 0.0001
18-24	404	62.4	243	37.6	
25-34	583	60.5	381	39.5	
35-44	467	62.6	276	37.1	
45-65	356	54.7	295	45.3	
Over 65	116	47.3	129	52.7	
Marital status					
Married	681	59.4	465	40.6	0.324 0.850
Single	1243	58.5	882	41.5	
Divorcee or widow	149	59.6	101	40.4	
Chronic Disease					
Yes	469	55.3	379	44.7	5.876 0.015
No	1604	60.0	1069	40.0	

*Row percentage

Table 4: Factors affecting self-medication

	P	Odds Ratio	95% CI for Odds Ratio
Gender	0.014		
Female	Ref		
Male	0.014	1.192	1.036-1.373
Education	<0.001		
Illiterate	*Ref*		
Literate	0.038	1.464	1.021-2.098
Primary school education	0.760	0.953	0.701-1.296
High school education	0.216	1.218	0.892-1.663
University education	0.003	1.608	1.171-2.207
Other	0.873	0.944	0.468-1.905
Age groups	0.002		
Over 65	*Ref*		
Under 18	0.043	1,517	1,013-2,274
18-24	<0.001	1,919	1,344-2,740
25-34	0.002	1,652	1,194-2,288
35-44	<0.001	1,820	1,310-2,528
45-65	0.070	1,339	0,976-1,836
Marital Status	0.069		
Single	*Ref*		
Married	0.582	1,054	0,874-1,271
Divorcee or widow	0.025	1,454	1,047-2,020

Self-medication was less frequent among people <18 years and >65 years of age. Likewise in a study carried out in Denmark, it was reported that usage of OTC drugs was more common among people between the ages of 25 years and 44 years (Nielsen *et al.,* 2003). Similarly in a national survey study conducted in Spain, use of non-prescribed medicines was found to be more common in younger people (15-64 years), whereas use of prescribed medicines is more common among older people (over 65 years) (Daban *et al.,* 2010). This data supports that 18-65 years of age, to be the age range that displayed the greatest strength of association with consumption of unprescribed medicines. More than one-third of the patients reported that they procured medicines after prescription but with out being sick or bought and kept at home to be used in case of need. The most common medicines these patients got prescribed or bought in order to keep at home were analgesics by 35.8%, antibiotics by 13.6% and cold remedies by 16.7%. Although, the percentages and rankings differ, in studies conducted in different countries like Spain, Finland, Palestine and Nigeria the most common OTC drugs were revealed to be analgesics, antibiotics and cold remedies (Carrasco-Garrido *et al.,* 2008; Turunen *et al.,* 2005; Sawalha *et al.,* 2008; Auta *et al.,* 2012). This reveals that OTC drug intake presents a similar pattern irrespective of any country in the globe.

In our study, 29.4% of the patients reported to use antibiotics without prescription and 55.5% of the patients discontinued antibiotic medication without using the entire box contents. Similarly, Pınar *et al.* (2013) reported the rate of antibiotic use without consulting a doctor by 30.5% and discontinuing antibiotherapy by 48%. Self-medication with antibiotics occurs worldwide, especially in developing countries, ranging from 9.5%-77.2% (Askarian and Maharlouie, 2012; Cizman *et al.,* 2005; Phuong *et al.,* 2006). At this point it may be stated that haphazard antibiotic use is associated with resistance development by the bacterial strains and that is a danger more important than its economic burden (İncecik *et al.,* 2009).

It is found that 44.4% of the patients had 1 to 5 boxes of unused or unfinished drugs in their houses and 37.5% of the patients discarded 1 to 3 boxes of drugs within a year even without opening the box, as the expiry date had already lapsed. It is also remarkable that 225 patients (6.8%) were using medicines on daily basis without suffering from any chronic disease. With an optimistic estimation, considering only the discarded boxes since the expiry date had lapsed, the patients in this study disposed of at least 7286 boxes of drugs over the past year. In Turkey, an average 7% of the medicines in pharmacies are disposed of due to expiry date. The expiry dates of 60% of the drugs that were kept at home come even without opening the box. The cost of the drug thrown into garbage is approximately 500 million dollars annually, which brings a heavy burden to the economy of a developing country such as Turkey (Pınar N, 2012).

Conclusively, irrational drug use has important consequences on both health and economy. Although the main responsibility falls on the physician, the participation of the patients is essential for RUD. Considering 54.0% of the patients had never heard the expression of rational drug use and rational use of antibiotics before, it may be concluded that awareness of RUD is inadequate in Turkey. Due to the high rates of haphazard use of drugs demonstrated in this study, drug usage without prescription, i.e. OTC drugs, should be discouraged. It is mandatory to take significant steps towards increasing awareness in terms of RUD with the cooperation of physicians, health organizations, educational institutions, non-governmental organizations and media. Might then be possible to achieve the expected benefits of the drugs. As a result, this study highlights the outline of the problems related to the rational use of drugs. Nation-wide population-based studies are needed to examine the problems in detail.

Strengths and limitations

The strength of the present study is that it is the study with the largest sample size related to the RUD conducted in Turkey. Additionally all health institutions in the province are included in the study.

Several limitations should be addressed however. First, this was a study only carried out on the applicants to health institutions that hinders the results to be extrapolated to general population. Second, as it is a survey study, memory factors that affect the responses to the questionnaire may exist. Third, the data collection period was eight days, which obstructs to assess the temporal characteristics of drug usage.

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