

Patients' attitudes and knowledge about drug use: a survey in Turkish family healthcare centres and state hospitals

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Background/aim: Irrational drug use is a common problem. This study aimed to evaluate patients' knowledge and habits concerning drug use, and compare them in terms of some sociodemographic characteristics.

Materials and methods: A face-to-face questionnaire was given to outpatients from family healthcare centres (FHCs) and state hospitals (SHs) in 12 provinces in Turkey during May 2010. A total of 4470 patients (FHCs: 2209; SHs: 2261) responded to the questionnaire (response rate: 93.1%).

Results: Getting prescriptions without a physical examination was common (second place in FHCs; third place in SHs); 51.0% stated that they wanted physicians to prescribe drugs that they had used before. More than half stated that antibiotics cured every illness. In addition, 55.9% reported that their relatives recommended drugs to them when they got ill; 37.1% reported that they recommended them to relatives as well. Of the survey respondents, 70.5% stated that they had stopped their medications before the recommended time. Patients' knowledge and attitudes about drug use showed significant differences in comparisons of sex, age, educational level, and social security.

Conclusion: Patients' knowledge and attitudes about drugs were far from rational. To eliminate irrational use of drugs, public education about drug use is needed.

Key words: Rational use of drugs, patient, family healthcare centre, state hospital

1. Introduction

The rational use of medicines (RUM) is one of the core components of treatment to obtain expected therapeutic benefits. RUM was defined as "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community" by the World Health Organisation (WHO) in Nairobi in 1985 (1). Healthcare organisations, particularly the WHO, have emphasised the importance of promoting RUM and have implemented many programs promoting it since 1985 (1–9). However, inappropriate prescription, distribution, and sale of more than half of medicines, as well as incorrect use by half of patients, have been reported worldwide (1,2). Unfortunately, the WHO has pointed out that fewer than half of all countries have implemented basic policies for

appropriate use of medicines, like regular monitoring of use (2).

Common examples of irrational use include polypharmacy, inappropriate use of antimicrobials, overuse of injections when oral formulations would be more appropriate, failure to prescribe in accordance with clinical guidelines, inappropriate self-medication (often of prescription-only medicines), and nonadherence to dosing regimens. All of these factors can cause treatment failures, adverse drug reactions, antimicrobial resistance, serious morbidity, mortality, and wastage of resources (1,2).

Patients as consumers are the final determinants of drug use, and many social, economic, or health-related factors can influence their decisions. These include the beliefs of family, friends, or community; information from prescribers, dispensers, and promotional material; and the

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unrestricted availability of medicines (4,5). Contributions to the RUM include an exploration of patients' knowledge as well as their attitudes and behaviours concerning drug use. Knowledge about public opinion and the nature and the size of the problem is important for implementing appropriate and effective arrangements and practices. The aim of the present study was to assess the use, knowledge, and attitudes about drugs that were utilised by outpatients from family healthcare centres (FHCs) and state hospitals (SHs) in Turkey, and to investigate whether their drug utilisation was associated with sociodemographic properties.

2. Materials and methods

This cross-sectional and descriptive study was conducted under the direction of the Turkish School of Public Health operating within the Turkish Ministry of Health (MoH) on health education and research projects, with permission given by the Turkish MoH. The participants consisted of 4470 patients of FHCs and SHs in urban and rural sections of 12 provinces (Amasya, Bartın, Bayburt, Bilecik, Bolu, Çankırı, Denizli, Eskişehir, Karabük, Kastamonu, Kırşehir, Gümüşhane) in different parts of Turkey in May 2010. At that time, Turkey had a total population of 73.7 million, 5.3% of whom lived in these 12 provinces (http://www.tuik.gov.tr/VeriTabanlari.do?ust_id=109&vt_id=28).

A face-to-face questionnaire was applied by pre-trained staff from the Provincial Health Directorates. Patients who had been randomly selected and had agreed to participate in the survey were included. Demographic characteristics (age, sex, educational level, having social security) and knowledge and attitudes about drug utilisation were questioned; answers were compared for these characteristics of patients from FHCs and SHs. The research report, a part of which is the basis for this article, was published by the Turkish MoH (10).

The data were analysed using Microsoft Office Excel and SPSS v.11.5. Frequency tables were used to show qualitative data. For the comparisons, a chi-square test was used and $P < 0.05$ was considered significant.

3. Results

A total of 4470 patients (FHCs: 2209; SHs: 2261) responded to the questionnaire (response rate: 93.1%). The 25–44-year age group included 46.2% of the patients; 57.4% were female, 43.7% had graduated from elementary school, and 96.9% had social security. Both of these groups had similar demographic characteristics (Table 1).

Most of the patients in FHCs and SHs reported that they mostly visited physicians as “the first application for evaluation of their disease” (53.9% and 69.3%,

Table 1. Demographic characteristics of the patients.

		FHCs n (%)	SHs n (%)	Total n (%)
Sex				
	Male	966 (43.7)	940 (41.6)	1906 (42.6)
	Female	1243 (56.3)	1321 (58.4)	2564 (57.4)
Social Security				
	Yes	2132 (96.5)	2199 (97.3)	4331 (96.9)
	No	77 (3.5)	62 (2.7)	139 (3.1)
Age (years)				
	15–24	317 (14.8)	324 (14.6)	641 (14.7)
	25–44	988 (46.2)	1022 (46.2)	2010 (46.2)
	45–64	629 (29.4)	641 (29.0)	1270 (29.2)
	65+	206 (9.6)	227 (10.2)	433 (9.9)
Education				
	Not graduated from elementary school	233 (10.5)	255 (11.3)	488 (11.0)
	Elementary school	1005 (45.5)	950 (42.0)	1955 (43.7)
	High school	618 (28.0)	673 (29.8)	1291 (28.8)
	University	353 (16.0)	383 (16.9)	736 (16.5)

FHCs: family healthcare centres; SHs: state hospitals.

respectively), followed by “getting prescription without physical examination” in FHCs (32.0%) and “follow-up visit” (17.4%) in SHs. The third reason was “follow-up visit” (10.6%) in FHCs and “getting a prescription without physical examination” in SHs (8.3%).

Patients who applied to get a prescription declared that they mostly (90.5%) wanted the physicians to prescribe drugs that they had used before; this was greater in FHCs than in SHs (FHCs: 92.3%, SHs: 84.1%). Others (9.5%) stated that they wanted physicians to prescribe drugs chosen by themselves or acquired from pharmacies; this number was greater in SHs than FHCs (FHCs: 7.7%, SHs: 15.9%). The most common drug class reported to be requested by the patients for prescription was analgesic/antirheumatic drugs (54.8%; FHCs: 55.7%, SHs: 51.6%), followed by antihypertensive drugs (29.6%; FHCs: 31.0%, SHs: 24.5%), antibiotics (25.7%; FHCs: 24.3%, SHs: 31.3%), and cold medications (25.7%; FHCs: 25.2%, SHs: 27.6%) (Figure 1).

When they were asked whether they wanted physicians to prescribe drugs that they had used before and had found beneficial, 51% of them answered “yes” (FHCs: 50.5%, SHs: 51.4%) and 35.5% answered “sometimes” (FHCs: 37.1%, SHs: 34.0%).

The most common types of drug information requested by patients from physicians were daily dosage (FHCs: 65.1%, SHs: 68.5%), side effects (FHCs: 62.6%, SHs: 65.5%),

and duration of therapy (FHCs: 61.9%, SHs: 66.0%), as reported by the patients (Figure 2).

When they were asked whether they would apply the treatment that was suggested by the physician, most of them (86.0%) reported that they would “definitely apply” (FHCs: 86.4%, SHs: 85.4%), compared with 14.0% reporting that they would “partially apply or would not at all” (FHCs: 13.6%, SHs: 14.4%).

When they were asked what they first did when they got sick, 51.4% reported that they consulted a physician (FHCs: 52.3%, SHs: 50.6%) and 37.4% reported that they used drugs they could find at home (FHCs: 36.1%, SHs: 38.7%).

When they were asked whether antibiotics cured every illness, answers were as follows: “yes” (FHCs: 8.7%, SHs: 7.1%), “sometimes” (FHCs: 17.8%, SHs: 16.0%), “no” (FHCs: 53.8%, SHs: 58.6%), and “didn’t know” (FHCs: 19.7%, SHs: 18.3%).

When they were asked which pharmaceutical form acted more rapidly, 67.5% replied “injection” (FHCs: 66.1%, SHs: 68.9%) and 13.7% declared that they had no idea (FHCs: 15.4%, SHs: 12.0%).

When they were asked whether there was correlation between cost and curative actions of drugs, 43.2% reported “no” (FHCs: 43.5%, SHs: 43.0%), 21.2% reported “there might be for some drugs” (FHCs: 20.1%, SHs: 22.2%), and 20.8% reported that they “didn’t know” (FHCs: 21.7%, SHs: 19.9%).

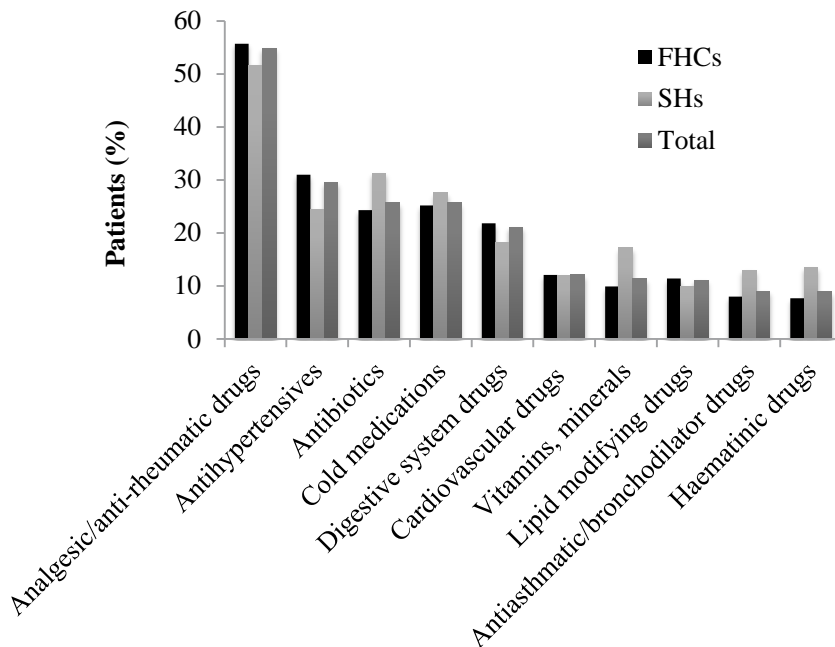


Figure 1. Distribution of drug classes which patients wanted physicians to prescribe (more than one drug class could be chosen. FHCs: family healthcare centres; SHs: state hospitals).

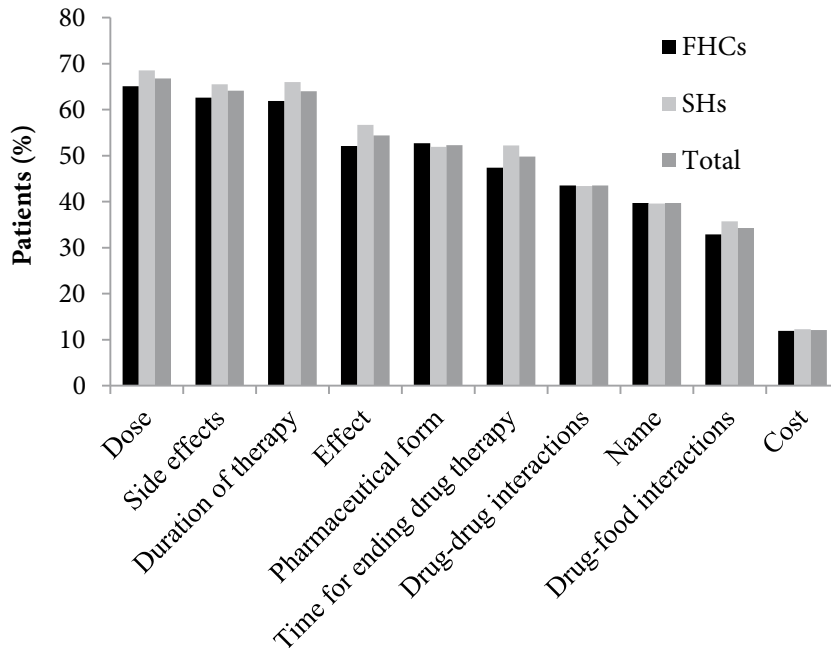


Figure 2. Distribution of drug information requested by patients (more than one option could be chosen. FHCs: family healthcare centres; SHs: state hospitals).

A total of 2464 patients (55.7%) (FHCs: 57.6%, SHs: 53.9%) stated that they did not buy drugs from a pharmacy without consulting a physician (Table 2). In FHCs, this was significantly more likely to be seen in those patients being female, ≥ 45 years old, not illiterate, or having social security ($P < 0.05$) (Tables 3–5). On the other hand, it was detected in SHs that male patients, especially those belonging to the 25- to 44-year-old group or those who were university graduates, were significantly more likely to buy drugs from a pharmacy without consulting a physician ($P < 0.05$) (Tables 3–5).

When they got sick, 55.9% of the patients (FHCs: 54.5%, SHs: 57.2%) reported that their relatives recommended a drug to them, and 37.1% (FHCs: 36.0%, SHs: 38.2%) reported that they recommended drugs to their relatives as well (Table 2). There were no statistically significant sex and social security differences in patients whose relatives recommended drugs ($P > 0.05$). They were mostly elementary school and high school graduates in FHCs and high school and university graduates in SHs ($P < 0.05$). In addition, in both FHCs and SHs, patients whose relatives did not give advice were mostly patients aged 45 and over ($P < 0.05$). In both FHCs and SHs, patients who gave drug advice to their relatives were mostly patients under the age of 45 years and high school and university graduates ($P < 0.05$) (Tables 3–5).

A total of 3134 patients (70.5%) stated that they had stopped taking their drugs before the time recommended

by their physicians (FHCs: 70.3%, SHs: 70.8%) (Table 2). For FHCs, these were mostly male patients ($P < 0.05$); there was no significant sex difference for SHs. In FHCs and SHs, there was no significant difference in terms of patients having social security ($P > 0.05$). In both groups, patients who stopped using their drugs were mostly under the age of 45 years and high school and university graduates ($P < 0.05$) (Tables 3–5).

A total of 2679 patients (60.4%) reported that they always read the prospectus (FHCs: 59.1%, SHs: 61.6%), (Table 2). In FHCs and SHs, patients who read the prospectus were mostly female patients, under the age of 45 years, and high school and university graduates ($P < 0.05$). There was no significant difference in terms of patients having social security (Tables 3–5).

More than half of the patients (52.9%) reported that they had leftover, reserved, or unused drugs at home (FHCs: 49.9%, SHs: 55.7%) (Table 2). In FHCs, patients who stored drugs in their homes were mostly females and patients with social security ($P < 0.05$); in SHs, there was no statistically significant sex or social security difference. In both groups, patients who gave this answer were mostly patients under the age of 45 years and high school and university graduates ($P < 0.05$) (Tables 3–5).

A total of 3518 patients (79.9%) stated that they looked at the expiry date of the drugs (FHCs: 81.7%, SHs: 78.1%) (Table 2). For FHCs, these patients were mostly female ($P < 0.05$); there was no significant sex difference for SHs. In

Table 2. Distribution of drug use attitudes of patients.

		FHCs n (%)	SHs n (%)	Total n (%)
When you get sick, do you buy drugs from a pharmacy without consulting a physician?	Yes	173 (7.9)	207 (9.2)	380 (8.6)
	Sometimes	752 (34.5)	827 (36.9)	1579 (35.7)
	No	1257 (57.6)	1207 (53.9)	2464 (55.7)
When you get sick, do your relatives recommend drugs to you?	Yes	379 (17.2)	428 (19.0)	807 (18.1)
	Sometimes	822 (37.3)	861 (38.2)	1683 (37.8)
	No	1000 (45.4)	965 (42.8)	1965 (44.1)
When your relatives get sick, do you recommend drugs to them?	Yes	211 (9.6)	229 (10.2)	440 (9.9)
	Sometimes	579 (26.4)	630 (28.0)	1209 (27.2)
	No	1407 (64.0)	1393 (61.9)	2800 (62.9)
Have you ever stopped using your drugs before the time recommended by your physician?	Yes	559 (25.4)	642 (28.6)	1201 (27.0)
	Sometimes	986 (44.9)	947 (42.2)	1933 (43.5)
	No	653 (29.7)	656 (29.2)	1309 (29.5)
Do you read the prospectus for drugs?	Yes	1296 (59.1)	1383 (61.6)	2679 (60.4)
	Sometimes	643 (29.3)	609 (27.1)	1252 (28.2)
	No	253 (11.5)	252 (11.2)	505 (11.4)
Do you have any drugs at home that you don't use?	Yes	1098 (49.9)	1254 (55.7)	2352 (52.9)
	No	1002 (45.6)	867 (38.5)	1869 (42.0)
	Don't know	99 (4.5)	129 (5.7)	228 (5.1)
Do you look at the expiry date of drugs before you use them?	Yes	1776 (81.7)	1742 (78.1)	3518 (79.9)
	Sometimes	250 (11.5)	314 (14.1)	564 (12.8)
	No	147 (6.8)	174 (7.8)	321 (7.3)

FHCs: family healthcare centres; SHs: state hospitals.

both groups, there was no significant difference in terms of having social security. In FHCs and SHs, patients who gave this answer were mostly patients under the age of 65 years, and high school and university graduates ($P < 0.05$) (Tables 3–5).

Near two-thirds of patients (64.5%) stated that they threw expired drugs away (FHCs: 65.0%, SHs: 63.9%).

4. Discussion

Data from our study confirmed that patients' knowledge and drug use habits were a long way from rational in Turkey. Getting prescriptions for beneficial drugs, self-medication, incorrect or insufficient knowledge about drugs, recommendation of drugs between relatives, noncompliance to drug therapy and storage of drugs were common, and these findings showed some sociodemographic differences. Patients in both healthcare centres had similar characteristics. Therefore, it can be said that comparisons of some responses by these features showed no great differences for FHCs and SHs.

According to RUM principles, patients must be part of their therapy during the therapeutic decision-making and drug use processes, and patients' pressuring physicians to get prescriptions or physicians' prescribing to satisfy patients are not recommended (1,11–13). Getting a prescription without a physical examination was common among patients in both FHCs and SHs. This may be related to patients' tendency to self-medicate, as well as prescription repetition for treatment of chronic diseases. This was also consistent with the finding that nearly half of the patients bought drugs from a pharmacy without consulting a doctor. Two studies from Turkey have revealed that 26.0% and 57.2% of participants used medicines without consulting a doctor (14,15).

It is notable that antibiotics were the second and fourth most demanded drug by patients in SHs and FHCs, respectively. This becomes more significant when the patients' misinformation about antibiotics is considered: only 53.8% in FHCs and 58.6% in SHs thought that antibiotics did not cure every illness. Irrational use of

Table 3. Comparison of patients' drug use attitudes by sex and social security.

		FHCs				SHs			
		Sex (%)		Social security (%)		Sex (%)		Social security (%)	
		M	F	Yes	No	M	F	Yes	No
When you get sick, do you buy drugs from a pharmacy without consulting a physician?	Yes	10.1	6.2	7.9	7.9	10.4	8.4	9.0	18.0
	Sometimes	37.3	32.3	34.0	47.4	40.1	34.6	37.0	32.8
	No	52.6	61.5	58.1	44.7	49.5	57.0	54.0	49.2
	Statistics	$\chi^2 = 21.5; P < 0.001$		$\chi^2 = 6.1; P < 0.05$		$\chi^2 = 12.6; P < 0.05$		$\chi^2 = 5.7; P > 0.05$	
When you get sick, do your relatives recommend drugs to you?	Yes	16.9	17.4	17.3	15.6	17.0	20.4	18.8	25.8
	Sometimes	39.9	35.4	37.2	41.6	40.2	36.8	38.4	32.3
	No	43.2	47.2	45.5	42.9	42.8	42.8	42.8	41.9
	Statistics	$\chi^2 = 4.9; P > 0.05$		$\chi^2 = 0.6; P > 0.05$		$\chi^2 = 5.0; P > 0.05$		$\chi^2 = 2.2; P > 0.05$	
When your relatives get sick, do you recommend drugs to them?	Yes	10.9	8.6	9.4	15.8	9.4	10.7	10.1	11.5
	Sometimes	26.9	25.9	26.1	32.9	30.0	26.5	28.2	21.3
	No	62.2	65.4	64.5	51.3	60.6	62.7	61.7	67.2
	Statistics	$\chi^2 = 3.9; P > 0.05$		$\chi^2 = 6.4; P < 0.05$		$\chi^2 = 3.7; P > 0.05$		$\chi^2 = 1.4; P > 0.05$	
Have you ever stopped using your drugs before the time recommended by your physician?	Yes	25.2	25.6	25.2	31.2	27.9	29.1	28.4	35.5
	Sometimes	47.6	42.8	44.9	44.2	44.0	40.9	42.5	30.6
	No	27.2	31.7	29.9	24.7	28.1	30.1	29.1	33.9
	Statistics	$\chi^2 = 6.4; P < 0.05$		$\chi^2 = 1.7; P > 0.05$		$\chi^2 = 2.3; P > 0.05$		$\chi^2 = 3.5; P > 0.05$	
Do you read the prospectus for drugs?	Yes	53.7	63.3	59.3	53.9	58.3	64.0	61.6	62.9
	Sometimes	34.1	25.7	29.2	34.2	30.5	24.7	27.1	29.0
	No	12.2	11.0	11.5	11.8	11.1	11.3	11.3	8.1
	Statistics	$\chi^2 = 22.1; P < 0.001$		$\chi^2 = 1.0; P > 0.05$		$\chi^2 = 9.7; P < 0.05$		$\chi^2 = 0.7; P > 0.05$	
Do you have any drugs at home that you don't use?	Yes	47.1	52.1	50.0	48.1	53.6	57.3	55.9	48.4
	No	47.3	44.2	45.9	36.4	40.3	37.3	38.3	46.8
	Don't know	5.6	3.6	4.1	15.6	6.1	5.5	5.8	4.8
	Statistics	$\chi^2 = 8.7; P < 0.05$		$\chi^2 = 23.3; P < 0.001$		$\chi^2 = 3.0; P > 0.05$		$\chi^2 = 1.8; P > 0.05$	
Do you look at expiry date of drugs before you use them?	Yes	79.2	83.7	81.9	76.6	76.8	79.0	78.2	74.1
	Sometimes	12.5	10.7	11.5	11.7	15.6	13.0	14.0	19.0
	No	8.3	5.6	6.6	11.7	7.6	8.0	7.8	6.9
	Statistics	$\chi^2 = 8.8; P < 0.05$		$\chi^2 = 3.1; P > 0.05$		$\chi^2 = 3.0; P > 0.05$		$\chi^2 = 1.2; P > 0.05$	

FHCs: family healthcare centres; SHs: state hospitals; M: male; F: female.

antibiotics causes many health problems such as resistance, inefficient treatment of infectious diseases, and higher treatment costs (16). Patients' reasons for demanding antibiotics need to be analysed with further investigations. According to a survey including participants from 9 countries (United Kingdom, France, Belgium, Italy, Spain, Turkey, Thailand, Morocco, and Colombia) where it was possible to get antibiotics directly from pharmacies despite it not being legal, irrational use and misinformation about

antibiotics were common (17). Other studies from Holland and China have also pointed to public misconceptions about the effectiveness of and indications for antibiotics (18,19). All these findings indicate the importance of public education about rational use of antibiotics.

Common sorts of drug information requested by patients mainly reflect those reported by other studies (20,21). These findings should be considered for physicians' training about RUM at the undergraduate and postgraduate levels of medical education.

Table 4. Comparison of patients' drug use attitudes by age groups.

		FHCs				SHs			
		Age groups (%)				Age groups (%)			
		15-24	25-44	45-64	65+	15-24	25-44	45-64	65+
When you get sick, do you buy drugs from a pharmacy without consulting a physician?	Yes	8.9	9.4	5.7	7.3	8.4	11.1	8.2	5.8
	Sometimes	31.8	37.5	33.0	31.6	32.0	41.6	34.5	31.4
	No	59.2	53.1	61.3	61.2	59.6	47.2	57.3	62.8
	Statistics	$\chi^2 = 16.7; P < 0.05$				$\chi^2 = 33.8; P < 0.001$			
When you get sick, do your relatives recommend drugs to you?	Yes	23.4	18.9	12.4	14.1	25.8	19.5	15.2	19.4
	Sometimes	43.0	37.8	37.2	30.6	40.7	40.6	36.0	33.0
	No	33.5	43.3	50.4	55.3	33.5	39.9	48.8	47.6
	Statistics	$\chi^2 = 42.4; P < 0.001$				$\chi^2 = 32.2; P < 0.001$			
When your relatives get sick, do you recommend drugs to them?	Yes	13.9	10.6	6.9	7.4	13.7	10.0	9.4	9.3
	Sometimes	31.6	28.0	24.2	18.1	32.3	31.1	24.8	20.2
	No	54.4	61.4	68.9	74.5	54.0	58.9	65.8	70.5
	Statistics	$\chi^2 = 35.1; P < 0.001$				$\chi^2 = 25.9; P < 0.001$			
Have you ever stopped using your drugs before the time recommended by your physician?	Yes	31.1	28.0	20.1	21.0	39.6	30.8	21.1	24.8
	Sometimes	46.8	46.3	43.0	39.0	41.4	45.2	40.6	36.7
	No	22.1	25.6	36.9	40.0	19.0	24.0	38.3	38.5
	Statistics	$\chi^2 = 47.9; P < 0.001$				$\chi^2 = 78.7; P < 0.001$			
Do you read the prospectus for drugs?	Yes	59.8	64.5	54.6	42.2	66.0	69.9	52.8	40.7
	Sometimes	28.5	29.9	30.6	27.0	25.2	24.4	30.6	32.7
	No	11.7	5.6	14.9	30.9	8.7	5.7	16.6	26.5
	Statistics	$\chi^2 = 118.5; P < 0.001$				$\chi^2 = 136.5; P < 0.001$			
Do you have any drugs at home that you don't use?	Yes	58.9	55.7	41.6	32.7	62.4	62.6	45.5	43.1
	No	33.9	40.3	55.2	59.5	32.3	33.5	46.6	48.4
	Don't know	7.3	4.0	3.2	7.8	5.3	3.9	8.0	8.4
	Statistics	$\chi^2 = 82.4; P < 0.001$				$\chi^2 = 70.4; P < 0.001$			
Do you look at expiry dates of drugs before you use them?	Yes	79.7	85.4	79.6	71.4	80.7	85.1	71.7	60.2
	Sometimes	12.9	11.1	12.0	11.6	12.0	10.9	18.0	20.4
	No	7.4	3.5	8.4	17.0	7.3	4.0	10.3	19.5
	Statistics	$\chi^2 = 54.2; P < 0.001$				$\chi^2 = 103.8; P < 0.001$			

FHCs: family healthcare centres; SHs: state hospitals.

Self-medication is a common practice, although it is supported only for minor illnesses. Factors related to the patient, society, law, availability of drugs, healthcare service, and exposure to advertisements can encourage self-medication; it can cause wastage of resources, increased resistance of pathogens, adverse reactions, and treatment failures (22). Declared as being exhibited by nearly half of the patients, self-medication was also shown to be influenced by different sociodemographic characteristics of our population. For instance, in both

FHCs and SHs, male patients were self-medicating more. It was expected that patients with a higher educational level in terms of medical awareness might be more likely to feel confident in self-medicating. However, both illiterate patients in FHCs and university graduates in SHs had a greater tendency to buy drugs from a pharmacy without consulting a physician.

In our study, recommendation of drugs between relatives was a common practice, significantly influenced by age and education. For instance, the number of patients

Table 5. Comparison of patients' drug use attitudes by level of education.

		FHCs				SHs			
		Education (%)				Education (%)			
		Not graduated	Elementary school	High school	University	Not graduated	Elementary school	High school	University
When you get sick, do you buy drugs from a pharmacy without consulting a physician?	Yes	14.1	5.2	8.4	14.6	9.0	7.8	9.1	13.2
	Sometimes	51.9	30.3	39.6	40.0	34.1	29.9	42.8	45.8
	No	34.0	64.5	52.0	45.4	56.9	62.3	48.1	41.1
	Statistics	$\chi^2 = 89.0; P < 0.001$				$\chi^2 = 64.4; P < 0.001$			
When you get sick, do your relatives recommend drugs to you?	Yes	20.3	15.9	20.2	15.3	21.0	18.7	18.4	19.6
	Sometimes	39.1	35.6	41.4	37.4	31.6	34.1	41.6	46.7
	No	40.6	48.5	38.3	47.3	47.4	47.3	40.0	33.7
	Statistics	$\chi^2 = 19.6; P < 0.05$				$\chi^2 = 31.6; P < 0.001$			
When your relatives get sick, do you recommend drugs to them?	Yes	9.1	7.9	12.7	9.4	12.2	9.5	10.0	10.7
	Sometimes	27.7	23.6	29.7	27.5	23.2	22.4	32.6	36.8
	No	63.2	68.5	57.6	63.1	64.6	68.1	57.4	52.5
	Statistics	$\chi^2 = 22.5; P < 0.001$				$\chi^2 = 43.7; P < 0.001$			
Have you ever stopped using your drugs before the time recommended by your physician?	Yes	21.5	25.2	26.4	27.0	23.3	25.8	32.4	32.5
	Sometimes	44.6	40.9	48.6	49.7	37.6	40.0	45.9	44.2
	No	33.9	33.9	25.0	23.3	39.1	34.2	21.7	23.3
	Statistics	$\chi^2 = 26.2; P < 0.001$				$\chi^2 = 49.4; P < 0.001$			
Do you read the prospectus for drugs?	Yes	38.3	62.5	58.6	64.2	36.4	58.9	66.5	76.6
	Sometimes	28.3	26.5	33.1	31.5	30.0	29.7	26.8	19.4
	No	33.4	11.0	8.3	4.3	33.6	11.4	6.7	3.9
	Statistics	$\chi^2 = 144.6; P < 0.001$				$\chi^2 = 198.1; P < 0.001$			
Do you have any drugs at home that you don't use?	Yes	37.3	45.6	56.0	59.9	40.8	49.6	62.4	68.9
	No	54.9	51.7	37.7	35.8	45.9	45.5	32.2	27.7
	Don't know	7.7	2.7	6.3	4.3	13.3	4.9	5.4	3.4
	Statistics	$\chi^2 = 68.5; P < 0.001$				$\chi^2 = 98.7; P < 0.001$			
Do you look at the expiry date of drugs before you use them?	Yes	68.9	82.7	81.9	87.0	52.6	77.5	83.4	87.5
	Sometimes	12.7	10.8	13.0	10.1	20.9	15.0	12.7	9.5
	No	18.4	6.5	5.1	2.9	26.5	7.5	3.9	2.9
	Statistics	$\chi^2 = 64.5; P < 0.001$				$\chi^2 = 180.9; P < 0.001$			

FHCs: family healthcare centres; SHs: state hospitals.

who got and gave drug advice diminished with increasing age. In addition, high school and university graduates were more likely to recommend drugs to their relatives. Our findings are consistent with those of other studies (21,23–25).

Compliance is an important issue in treatment success. It has been reported that approximately 50% of patients did not take medications as prescribed (26). Noncompliance, such as failure to completely apply the recommended therapy or discontinuance before the

suggested time, was also revealed in this study. Moreover, in both groups, patients who had stopped their therapy early were most likely to be the patients under the age of 45 years and high school/university graduates. These results indicate a compliance problem for certain patient groups. Considering that antibiotics and antihypertensive drugs are among the most demanded drugs, it would be helpful to conduct educational programmes to raise patients' awareness about possible consequences of noncompliance.

Nearly 40% of patients stated that they did not read the prospectus properly, a significantly more common practice in men, patients ≥ 45 years old, and those who had not graduated from high school or university. These findings suggest that physicians and pharmacists should emphasise the importance of patient information leaflets to patients, while taking these demographics into consideration.

Patients' drug storage and self-medication tendencies in our study were in line with those reported in the literature (21,27–29). Expiration date and disposal of expired or unused drugs have importance for drugs stored at home. Four out of 5 participants stated that they looked at expiry dates of drugs. Studies from Turkey have reported that 85.8% of patients checked and 28.3% of patients did not check expiry dates of drugs (15,21). Most of the participants (64.5%) reported that they threw drugs away. Disposal of medicines is also a common inappropriate practice in other countries. It has been emphasised that there is confusion about the proper disposal of drugs, and there is an urgent need to implement a formalised protocol for disposal and destruction of pharmaceuticals by patients around the world (30).

This study is predominantly descriptive and only 4470 patients from 12 of 81 provinces were enrolled, which may limit the generalisation of the study findings. There were no mechanisms to objectively assess the honesty of the participants' answers. In addition, no attempt was made to observe patients' habits during their drug therapy. The role played by physicians is critical in patients' irrational drug use behaviours. Considering that around three-quarters of the prescriptions in general practice were reported to be repeat items (31,32), the comprehensive 6-step approach of the rational pharmacotherapy (11) process might well be practised by specialists or general practitioners, which in turn may influence patients' knowledge, attitudes, and behaviours regarding RUM. This could also be one of the

limitations of the study.

Despite the limitations described above, this is the first comprehensive study that reflects the knowledge and attitudes of patients about drug use in Turkey. Thus, it could be regarded as a well-defined extension to the previous findings in the literature, providing valuable information for evaluating and improving patients' drug use and for implementing appropriate RUM activities for the public. Healthcare providers should be informed about the results of such studies. These can be beneficial for physicians in making decisions about therapeutic regimens and also for pharmacists dispensing drugs.

In conclusion, the present study revealed knowledge and attitudes of patients from different levels of healthcare regarding drug use, comparing them on the basis of some sociodemographic characteristics. In both FHCs and SHs, patients' attitudes and knowledge about drug use were far from rational. This included the use of nonprescription drugs, recommendation of drugs to relatives, noncompliance with therapy, and misinformation about drugs, particularly antibiotics. In addition, these results showed marked sociodemographic differences. In light of the present findings, further studies with larger samples should be implemented, not only assessing behaviours relating to drug utilisation, but also further enhancing the results by directly evaluating the underlying internal and external factors that lead patients to irrational use, and its consequences in real life. Patients' inappropriate attitudes and misinformation or lack of information about drug use, particularly for antibiotics, emphasise the need for educational and administrative arrangements to eliminate irrational use of medicines.

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