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PUBLIC KNOWLEDGE AND ATTITUDES REGARDING SELF MEDICATION WITH ANTIBIOTIC IN GAZIANTEP, TURKEY

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ABSTRACT   Inappropriate self-medication practice is a cause of growing concern among public. This study was carried out to investigate the factors among people living in Gaziantep that lead to self-medication with antibiotics, including the influential factors. It was completed with 2057 partipicants as a descriptive study. The results showed that 49.3% of the participants had started self-medicating with antibiotics. The reasons for starting self-medicating with antibiotics were as follows; common cold and flu; sore throat; fever; cough; abdominal pain; weakness; urinary burning and skin infection. When the factors that affected starting using self medicated with antibiotics by their own without getting doctor's advice were scrutinized; they found to be using the same antibiotic prescribed by doctor in previous similar conditions; there was no time to visit the doctor; using the drug advised by close friends and relatives; had no intention to pay the examination and test fees; and consulting pharmacist regarding the medicine use. It was identified that 56.4% have maintained antibiotic at home in case it might be necessary in the future; 70.6% have used antibiotic at the prescribed dose and timeframe; 20.0% have heard the term of antibiotic resistance previously; only 58.5% have defined antibiotic resistance correctly. It was determined that approximately half of them had started using antibiotics on their own and the majority of them did not hear the term of antibiotic resistance correctly.

Introduction

In the past 70 years, antibiotics have affected and improved the treatment of many symptomatic infections (McCormack and Allan, 2012). The correct use of antibiotics is critical to preserve their efficacy and to prevent resistance in the treatment of bacterial infectious diseases (Belkina et al, 2014; Promise et al, 2014). However, inappropriate use of antibiotics in recent years has led to reduced clinical effectiveness, increased treatment costs, and changes in the sensitivity of the organism to the antibiotic (McCormack and Allan, 2012). In addition, the use of inappropriate antibiotics has made antimicrobial resistance a major problem worldwide (CDC, 2017; Hollaway et al, 2016). The most important factor that increases the risk of antibiotic resistance is widespread self-medication with antibiotics. Self-medication is defined as the use of medication without a prescription or without professional advice for self-treatment of the individual (Osemene & Lamikanra, 2012). At the 68th World Health Assembly in 2015, the World Health Organization approved a global action plan to overcome antimicrobial resistance (WHO, 2017). Turkey is among the European countries with the highest use of antibiotics. The use of antibiotics ranks fourth or fifth among all medicines in Europe, whereas it is ranked first in Turkey. Approximately 40-50% of all cases of antibiotic use are thought to be unnecessary (Şencan, 2011). Therefore, in 2015, the Ministry of Health of the Republic of Turkey (MHRP) undertook a national approach to address the overuse and inappropriate use of antibiotics (MHRT, 2015; Şencan, 2011). The province of Gaziantep, in which the present study was performed, was chosen as the pilot province because the number of antibiotics prescriptions relative to the population in Gaziantep is among the highest in the country. Therefore, we investigated the causes of unreasonable antibiotic use to help determine potential corrective actions (MHRT, 2015, TITCK, 2015). Various factors affecting inappropriate and unnecessary self-medication with antibiotics have been discussed in the literature. Many studies have indicated that antibiotic use is related to the attitudes and behaviors of the public, the individual's awareness level and knowledge about antibiotics, restrictions on access to health services, high cost and unregulated drug distribution (Belkina et al, 2014; Pavyde et al,

2015; Promise et al, 2014). In addition, studies have shown that the use of antibiotics can be related to different factors, such as culture, gender, education, residence, marital status, age, number of children, health insurance and health dissatisfaction, care services and home antibiotics storage, mild illnesses, the treatment of similar diseases, economic factors and the lack of adequate healthcare personnel (Gebeyehu et al, 2015; Jain et al, 2011; Pavyde et al, 2015; Verma et al, 2010). Antimicrobial resistance, which has become an international health threat, is now considered a critical public health concern (Al-Yamani et al, 2016). Therefore, examining the behavior of the public and then correcting false information and attitudes are important factors in preventing the development of antibiotic resistance and to reduce the inappropriate and unnecessary use of antibiotics in society (Drozd et al, 2015; Res et al, 2017).

This study was carried out to investigate the factors among people living in Gaziantep that lead to self-medication with antibiotics, including the influential factors, and to increase public awareness of this issue.

Methods

Gaziantep is a province of Turkey and the eighth most populous city.[18] A cross-sectional survey was conducted as a social responsibility project at Gaziantep's largest shopping center between January and May 2016. The inclusion criteria of the study were defined as living in Gaziantep, voluntary participation in the study and greater than 18 years of age. Respondents were drawn from a convenience sample of 2057 participants from the general population included in the study. This study excluded any person who was not willing to participate in the study or had emotional, psychiatric, or intellectual disturbances. Forty nursing students who took courses under the Social Responsibility Project at the Faculty of Health Sciences of Gaziantep University and whose instructors were responsible for the research were selected as the "Rational Antibiotic Use Advisory Group". These students were divided into four groups of 10 people. Each group was trained in one-hour sessions for a total of three days on rational antibiotic use by a pharmacist who was responsible for Rational Drug Use. The training

included individual training and counseling using a PowerPoint presentation on our goals and targets, pharmacokinetics, antibiotic usage rates, risks and benefits of antibiotics, reasons for antibiotic use, self-antibiotic initiation and rational antibiotic use. It was estimated that each student in the counselor group will enroll at least 50 participants.

After the consultant group was trained, a stand was set up at the entrance floor of the shopping center. Data were collected at different time periods, such as the morning, noon and evening hours. The counselor group was divided into four groups of 10 people according to these time periods. At the shopping center, the data were collected using the established sampling method and information forms. The questionnaires were completed by the participants in approximately 15-20 minutes. Each individual who completed the information form was provided a training brochure about rational antibiotic use that was developed by the MHRP and underwent oral training by the advisory group on self-medicating with antibiotics and rational antibiotic use (MHRT, 2015).

In this study, a 25-question data collection tool was developed using previous studies on this subject (Çelik et al, 2010; Gül et al, 2014; Verma et al, 2010). This questionnaire form contained closed and open-ended questions about various demographic variables, self-medication with antibiotics and the influential factors. The questionnaire was validated by a pharmacist and four faculty members of nursing or medicine. To optimize the clarity of the language used and the structure of the questionnaire, a pilot study was conducted among 30 participants who were not included in this study. Based on the results, the questionnaire was modified in terms of comprehensibility and usability by the researchers.

Data were entered in SPSS for Windows (version 22.0) for analysis. Categorical measurements are summarized as numbers and percentages, and quantitative measurements are summarized as the mean and standard deviation. The chi-squared test was used in this study to assess the associations between variables. The authors compared responses about knowledge and the use of antibiotics, with a p value of .05 indicating statistical significance.

The study was approved by the Gaziantep University Civic Involvement Project Committee and Institutional Review Board. Written permission was obtained from all the participants by the Gaziantep University Department of Civic Involvement Project and the shopping mall. Each participant was clearly informed that their participation in the study would remain confidential, voluntary, and anonymous.

Results
Of the 2300 questionnaires that were distributed, 243 were returned uncompleted, and 2057 were completed (the response rate was 89.4%). The mean age of the participants was 27.86±1.10 years, and 51.3% was female. There were significant differences in education level and living region based on whether the participant self-medicated with antibiotics (p<.05) (Table 1).

The results showed that 49.3% of the participants had started self-medicating with antibiotics. Additionally, 60.4% of the participants used antibiotics in the past year, and 35.3% of the participants used antibiotics within the last month. The reasons for self-medicating with antibiotics were as follows: common cold/flu, sore throat, toothache/swelling, headache, cough, fever, weakness, abdominal pain, urinary burning, and skin infection. The reasons for self-antibiotic initiation without a doctor's advice were examined and included the following: antibiotics were given by the doctor in similar previous situations, not having time to visit the doctor, asking the pharmacist, not wanting to undergo a medical exam and pay the examination fee and obtaining the advice of acquaintances in the surrounding area (Table 2).

It was identified that 56.4% of participants kept antibiotics at home in case they might be necessary in the future; 20.0% had previously

heard the term antibiotic resistance. A statistically significant difference was found in whether antibiotics were kept at home and whether the patient was aware of the term antibiotic resistance based on whether the participant self-medicated with antibiotics (p<.05) (Table 3).

Discussion
The use of inappropriate antibiotics has become a major health problem not only in Turkey but also worldwide. Increasing antibiotic resistance in societies and the associated economic burden have led health governments in various countries to take action. Therefore, the present study is important in determining the awareness and attitude of the people regarding antibiotic resistance.

This study determined that approximately half of the participants started using antibiotics on their own without a doctor's advice. In two studies conducted with Chinese and Arabian individuals, 64.4% and 63.6% of the participants, respectively, self-medicated with antibiotics without a doctor's advice; these rates were higher than those in our study (Ye et al, 2017; Zowalaty et al, 2016). In two studies conducted in Iran and Lithuania, 40.0% and 31.0% of the participants, respectively, self-medicated with antibiotics, which were lower than the rates of self-medication determined in our study (Kamran et al, 2015; Pavyde et al, 2015). In a systematic review of 21 articles on self-medication, the self-medication frequency varied from 12.8% to 77.1%, with an average of 36.8%. (Ayalew, 2017). As shown, the rates of self-antibiotic use vary from country to country. These variances may be due to several factors that affect self-antibiotic initiation. In our study, the rates of self-antibiotic initiation were higher among younger people, high school graduates, men, high-income people, and people who live in cities. Similar to our study, a study conducted in Turkey found that self-antibiotic use was higher among males and younger individuals with higher education levels (Nayır et al, 2016). Similarly, in another study, self-antibiotic use was found to be higher among males, younger people and people in rural areas (Pavyde et al, 2015). When the literature was examined, it was found that self-antibiotic initiation was affected by factors besides demographic characteristics. In our study, factors such as using the antibiotics given by the doctor in similar previous situations, not having time to go to the doctor, pharmacy counseling, not wanting to pay the examination fee and asking friends about the medicine were found to affect antibiotic initiation. Similar to our study, a study conducted in Sind determined that participants self-medicated with antibiotics because 88.0% of the participants did not want to pay the examination fee, 72.0% could easily obtain medication from the pharmacy, and 22.1% did not have time to visit the doctor (Bilal et al, 2016). In a study conducted in India, it was found that 86.2% of the population self-medicated using the same antibiotics previously prescribed by their physician (Desai et al, 2016). In a study conducted in Ethiopia, dissatisfaction with health services was found to influence antibiotic use (Gebeyehu et al, 2015). Furthermore, a review reported that while the underlying reason for self-medication initiation was stated as contracting a similar disease, self-medication was often recommended by pharmacists and the person's friends (Ayalew, 2017). When the causes of self-antibiotic initiation were examined, similar to our study, colds, fever, cough, and sore throat were identified as the most common reasons for self-medication with antibiotics (Bilal et al, 2016; Gebeyehu et al, 2015; Nayır et al, 2016; Pavyde et al, 2015). In addition, studies have shown that people have a lack of knowledge about antibiotic use and that they exhibit different behaviors related to the use of antibiotics. In our study, it was determined that more than half of the participants read the information pamphlet before starting antibiotics and that two-thirds used the antibiotics at the recommended dose and time. In a study, 57.1% of the participants were found to stop using antibiotics when they felt well (Ye et al, 2017). In contrast to our results, another study found that 39.3% of patients were using antibiotics at the recommended dose and time (Zowalaty et al, 2016). In a study conducted in France, it was determined that people had good knowledge of antibiotic use; however, their behaviors regarding antibiotic use were inadequate,

such as not following dosing schedules and the prescribed duration of treatment (Demore et al, 2017). In addition, our study results, which were compatible with the literature, showed that participants kept antibiotics at home in case they are needed in the future (Çelik et al, 2010; Ye et al, 2017; Zowalaty et al, 2016). One of the greatest risks of inappropriate antibiotic use is antibiotic resistance. In our study, it was determined that most of the participants did not have prior knowledge of the term antibiotic resistance. Similar to our study, studies in Kuwait, India and Italy have shown that people have insufficient knowledge about antibiotic resistance (Awad & Aboud, 2015; Desai et al, 2016; Napolitano et al, 2013). In addition to these data, in our study, almost half of the participants demanded that their doctors prescribe antibiotics. Studies in Kuwait, India and Italy have reported that 64.7%, 64.0%, and 74.5% of participants, respectively, had asked their doctors to prescribe antibiotics for any reason; these rates were higher than those in our study (Awad & Aboud, 2015; Çelik et al, 2010). A high number of people claiming to request antibiotic prescriptions shows that the patients anticipated the prescription for antibiotics and that they sought antibiotics as a remedy.

Conclusion

The results determined that more than half of the participants had used antibiotics at least once in the past year; approximately half had started using antibiotics without a doctor's advice, and most had never heard of the term antibiotic resistance. Self-antibiotic medication rates were found to be higher in younger people, high school graduates, males, high-income people and those living in the cities. The decision to self-medicate with antibiotics was affected by being satisfied with previous antibiotic use, the desire to not pay an examination fee, the advice from the pharmacist and the advice from an acquaintance. Antibiotics that rapidly develop resistance when used extensively and incorrectly become ineffective in the treatment of infections caused by the bacteria that we expect to have the primary effect. Antibiotics should not be used unless a physician prescribes them. The public should be made aware that antibiotics used in a previous illness should not be used without consulting the doctor, even if the person developed a similar illness. People should be informed that antibiotics are not substitutes for treatment, especially in respiratory tract infections due to viruses such as influenza or colds. We believe that increasing the activities and campaigns related to the use of antibiotics may reduce their unnecessary use.

Limitations of the study

This study was a cross-sectional study with a non-random convenience sample. Therefore, it includes all the limitations of a cross-sectional study. The sample included only one mall in Gaziantep which may limit the generalizability of our findings to other populations.

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Table 1. Distribution of Sociodemographic Variables According to Self-Medication with Antibiotics (N=2057).

Variables	Self-Medication with Antibiotics						X²	P
	Yes		No		Total			
	N	%	n	%	n	%		
Age group (years)								
18-24	528	52.0	544	52.2	1072	52.1	2.287	.515
25-31	204	20.1	215	20.6	419	20.4		
32-38	124	12.2	107	10.3	231	11.2		
39 and older	159	15.7	176	16.9	335	16.3		
Educational level								
Primary school	312	30.7	250	24.0	562	27.4	11.976	.007*
Secondary school	362	35.7	404	38.8	766	37.2		
High school or university	341	33.6	388	37.2	729	35.4		
Gender								
Female	503	49.6	553	53.1	1056	51.3	2.542	.112
Male	512	50.4	489	46.9	1001	48.7		
Employment								
Yes	459	45.2	457	43.9	916	44.5	0.387	.535
No	556	54.8	585	56.1	1141	55.5		
Perception of income level								
Sufficient	704	69.4	730	70.1	1434	69.7	0.119	.737
Not sufficient	311	30.6	312	29.9	623	30.3		
Living region								
Province	701	69.1	770	73.9	1471	71.5	6.357	.042*
Town	217	21.4	195	18.7	412	20.0		
Village	97	9.6	77	7.4	174	8.5		
Chronic disease								
Yes	123	12.1	140	13.4	263	12.8	0.800	.391
No	892	87.9	902	86.6	1794	87.2		

Table 2. Distribution of the Factors Affecting the Use of Antibiotics According to Self-Medication with Antibiotics.

Variables	Self-Medication with Antibiotics						X²	P
	Yes		No		Total			
	n	%	n	%	n	%		
Used antibiotics in the past year								
Yes	702	69.2	541	51.9	1243	60.4	63.930	.001*
No	313	30.8	501	48.1	814	39.6		
Used antibiotics in the past month								
Yes	452	44.5	275	35.3	727	35.3	74.042	.001*
No	563	55.5	767	64.7	1330	64.7		
Reasons for self-medicating with antibiotics (n=1015) a, b								
Common cold/flu	455	44.8	-	-	455	44.8	-	
Sore throat	309	30.4	-	-	309	30.4		
Toothache/swelling	259	25.5	-	-	259	25.5		
Headache	245	24.1	-	-	245	24.1		
Cough	235	23.2	-	-	235	23.2		
Fever	226	22.3	-	-	226	22.3		
Weakness	145	14.3	-	-	145	14.3		
Abdominal pain	127	12.5	-	-	127	12.5		
Urinary burning	87	8.6	-	-	87	8.6		
Skin infection	42	4.1	-	-	42	4.1		
Factors that affected self-medication with antibiotics without obtaining a doctor's advice (n=1015) a,b								
Used the same antibiotics prescribed by a doctor in similar previous conditions	549	54.1	-	-	549	54.1	-	
There was no time to visit the doctor	334	32.9	-	-	334	32.9		
Consulting with a pharmacist regarding the drug	279	27.5	-	-	279	27.5		
Not wanting to pay the examination and test fees	250	24.6	-	-	250	24.6		
Used the drug advised by close friends and relatives	101	10.0	-	-	101	10.0		
Demanded an antibiotics prescription from a doctor when they visited the doctor for any reason								
Yes	562	55.4	215	20.6	777	37.8	2.639	.001*
No	453	44.6	827	79.4	1280	62.2		

*p<.05; a Statistical analysis was not performed because more than one option was selected; bResponses of participants who had been

using antibiotics on their own.

Table 3. Distribution of the Participants' Knowledge and Attitudes Concerning Self-Medication with Antibiotics.

Variables	Self-Medicating with Antibiotics						X²	P
	Yes		No		Tptal			
	n	%	n	%	n	%		
Kept antibiotics at home in case they may be necessary in the future								
Yes	650	64.0	510	48.9	1160	56.4	47.642	.001*
No	365	36.0	532	51.1	897	43.6		
Read the information pamphlet before using antibiotics								
Yes	600	59.1	676	64.9	1276	62.0	7.248	.007*
No	415	40.9	366	35.1	781	38.0		
Used antibiotics at the prescribed dose and time frame								
Yes	680	67.0	772	74.1	1452	70.6	12.460	.001*
No	335	33.0	270	25.9	605	29.4		
Thought that antibiotics would be harmful								
Yes	468	46.1	594	57.0	1062	51.6	27.476	.001*
No	302	29.8	272	26.1	574	27.9		
No opinion	245	24.1	176	16.9	421	20.5		
Advised others on antibiotic use								
Yes	338	33.3	270	25.9	608	29.6	13.482	.001*
No	677	66.7	772	74.1	1449	70.4		
Thought that self-medication of antibiotics was unnecessary								
Yes	288	28.4	232	22.3	520	25.3	10.160	.002*
No	727	71.6	810	77.7	1537	74.7		
Received information about unnecessary antibiotic use								
Yes	400	39.4	501	48.1	901	43.8	15.707	.001*
No	615	60.6	541	51.9	1156	56.2		
Self-medicated with antibiotics prescribed to her/his children								
Yes	176	17.3	135	13.0	311	15.1	12.600	.002*
No	348	34.3	424	40.7	772	37.5		
No children	491	48.4	483	46.4	974	47.4		
Who should decide whether to start antibiotics								
Only me	154	15.2	162	15.5	316	15.4	4.350	.114
Only doctor	579	57.0	632	60.7	1211	58.9		
Together	282	27.8	248	23.8	530	25.7		
Previously heard of the term antibiotic resistance								
Yes	178	17.5	234	22.5	412	20.0	7.770	.006*
No	837	82.5	808	77.5	1645	80.0		
Defined antibiotic resistance correctly (n=412) a								
Yes	102	57.3	139	59.4	241	58.5	0.183	.687
No	76	42.7	95	40.6	171	41.5		

*p<.05; a Responses of participants who had heard of antibiotic resistance

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