RESEARCH

Knowledge and Behavior of Dentistry Patients About the Use and Misuse of Antibiotics: A Cross-Sectional Study

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ABSTRACT

Knowledge and Behavior of Dentistry Patients About the Use and Misuse of Antibiotics: A Cross-Sectional Study

Background: Antibiotics are being used frequently in dental infection and this study focused on the knowledge and behavior on antibiotic use of dentistry patients to reveal major mistakes leading to drug misuse.

Methods: This cross-sectional survey was conducted among Trakya University Faculty of Dentistry patients between March and June 2019. The data were collected using a questionnaire and analyzed using IBM SPSS Statistics 22 (IBM SPSS, Turkey) for statistical analysis. Chi-square test, Fisher's Exact test, Fisher Freeman Halton test, and Continuity (Yates) Correction were used for comparison of qualitative data and frequency. Significance was evaluated at the $p<0.05$ level.

Results: A total of 350 patients participated in this study. The rate of self-treatment with antibiotics was 31.7% (n=111) and the rate of asking for prescribing antibiotics without being sick is 9.7% (n= 34). 24.9% (n=87) of the participants use antibiotics until their complaints stop. 50.6% (n=177) of the participants think that antibiotics given in dental infections are also effective in other infections. Among the educational backgrounds, high rates of antibiotic misuse behavior were found in all groups.

Conclusion: This study has identified an urgent need for widespread investigations and educational interventions for patients regarding antibiotic usage, especially in dental situations.

KEYWORDS

Antibiotics Use, Antimicrobial Resistance, Dentistry, Drug Misuse

ÖZ

Diş Hekimliği Hastalarının Antibiyotik Kullanımı Üzerine Bilgi ve Davranışlarının Değerlendirilmesi : Kesitsel Anket Çalışması

Amaç: Bu anket çalışmasının amacı dental enfeksiyonlarda en sık kullanılan ilaçlar olan antibiyotikler hakkında diş hekimliği hastalarının bilgi ve davranışlarının analiz edilmesiyle hatalı ilaç kullanımına yol açan etkenleri ortaya çıkarmaktır.

Gereç ve Yöntemler: Bu kesitsel anket çalışması Mart 2019-Haziran 2019 tarihleri arasında Trakya Üniversitesi Diş Hekimliği Fakültesi'ne gelen hastalar arasında gerçekleştirildi. Veriler bir anket kullanılarak toplandı ve istatistiksel analiz için IBM SPSS Statistics 22 (IBM SPSS, Türkiye) kullanılarak analiz edildi. Nitel verilerin ve frekansın karşılaştırılmasında Ki-kare testi, Fisher's Exact testi, Fisher Freeman Halton testi ve Süreklilik (Yates) Düzeltmesi kullanıldı. Anlamlılık $p<0.05$ düzeyinde değerlendirildi.

Bulgular: Bu çalışmaya toplam 350 gönüllü katıldı. Doktora danışmadan antibiyotik ile kendi kendine tedavi oranı %31.7 (n=111) ve hasta olmadan evde bulundurmak üzere doktordan antibiyotik isteme oranı %9.7 (n= 34) olarak bulundu. Katılımcıların %24,9'u (n=87) şikayetleri bitince antibiyotik kullanmayı bıraktığını ve %50,6'sı (n=177) diş enfeksiyonlarında verilen antibiyotiklerin diğer enfeksiyonlarda da etkili olduğunu düşündüklerini belirtti. Eğitim seviyesi gruplarının tümünde yüksek oranda antibiyotik kötüye kullanım davranışı bulundu.

Sonuç: Bu çalışma sonuçları diş kaynaklı rahatsızlıklardaki antibiyotik kullanımı ile ilgili olarak, hastalar arasında bilgilendirme ve eğitimsel müdahalelere acil bir ihtiyaç olduğunu belirlemiştir.

ANAHTAR KELİMELER

Antibiyotik Kullanımı, Antimikrobiyal Direnç, Diş Hekimliği, İlaç Kötüye Kullanımı

1. INTRODUCTION

Antibiotics are the most important drugs in the treatment of dentistry-related infections and unfortunately still among the drug groups with the most misuse. There is a lot of misinformation about antibiotics, especially from media and internet sources and these incorrect instructions lead people to unhealthy or unnecessary self-medication. The most well-known effect of incomplete or incorrect antibiotic usage is the development of drug resistance. It has been estimated that approximately 700,000 deaths occur annually due to antimicrobial drug resistance, and it is expected that this will be approximately 10 million by the time 2050 if action is not taken to reduce inappropriate use of antibiotics.[1]

The development of resistance to an antibiotic is a real real handicap that concerns not only dental but also full-body systems. Treatment of infections that develop with resistant strains becomes difficult to diagnose and may also result in increased treatment costs, and more expensive drugs with more side effects may be required. In addition, the spread of genes responsible for resistance by the transmission of these resistant strains and the resistance genes is an important factor that threatens public health.[2] Incorrect or unnecessary use of antibiotics or overusing them can easily lead to the development of resistant bacterial strains, and also the adverse reactions are reflected as an economic burden on natural health system.[3]

The primary responsibility for the use of antibiotics is the physicians. Prescribing appropriate drugs in the required dose with the right indication is one of the most basic

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principles of medicine. Continuous control and information updates are made by both WHO (World Health Organizations) and countries' ministries of health regarding the antibiotic prescribing habits of physicians, nevertheless, doctors also need to be sensitive to be informed about antibiotic-resistant diseases in their own countries and updates in this regard. Antibiotic usage is affected by many factors such as relaxed health policies about antibiotic use, the ability to purchase antibiotics without a prescription, patients' awareness, attitudes and behavior of using the drugs, physicians' prescribing knowledge, and physician-patient cooperation. Many strategies are recommended worldwide, such as regular physician training, getting approval from an infection specialist for prescription, formulary replacement, or restriction of drugs for rational antibiotic reasonable that will minimize the development of resistance.[3]

In the light of these information, the current study aims to determine attitudes and behavior on antibiotic use of patients who come to dentistry faculty and to explore the areas that need to be intervened to eliminate the reasons that lead to antibiotic misuse.

2. MATERIAL AND METHODS

2.1 Study design

This was a cross-sectional study using a survey questionnaire as the method of data collection, with one data collection point.

2.2 Study Population

Participants were selected from those referred to Trakya University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Edirne, Turkey, for routine dental care. The participation was voluntary, and confidentiality was assured

2.3 Study Period

The data were collected from 1st March to 30th June 2019.

2.4. Sample size calculation

Three hundred-fifteen persons were required to detect a significant difference in the effect at 85 percent power and a standard error of 5%. In all, 350 persons participated in the study.

2.5 Contents of the questionnaire

The questionnaire has been prepared according to the physician's own experience and expertise about patient's behavior and problems, no adaptation from previous studies has been done.

The questionnaire is composed of three sections:

- Between 1 and 3 are demographic questions. It was compared the data according to age, gender, and education level.
- Between 4 and 11, it was evaluated the antibiotic knowledge and antibiotic usage behavior of the patients for their general health status.
- Questions 12–19 were added to evaluate the knowledge and behavior of patients about the use of antibiotics in dentistry.

The value and contents of the questions were established by two oral and maxillofacial surgeons at Trakya University. According to Eysenbach[4] for checking the clarity and readability of the questionnaire, the conduction of a pilot study on 35 volunteers (%10 of the sample size) was performed before applying on a larger population. Results from the 35 participants were excluded from the final statistical analysis.

2.6 Data Collection

Answering the survey was done in Trakya University Oral and Maxillofacial Surgery clinics. The patients were informed about the aim and intentions of the study and that study participation was entirely voluntary, with no penalty for nonparticipation. Written consent was obtained before the survey-filling process and later volunteers were given a form to fill and to put in a sealed envelope after answering is completed.

There was no physician or researcher near the patient while filling out the form. The survey took approximately 10 min to complete. There was either a request to choose just one answer or the possibility of choosing more than one answer for each question. All information was collected anonymously and all the information was treated with confidentially. Questionnaires with unanswered questions were not included in the study.

2.7 Ethical Statements

All protocols of this study were reviewed and approved by the Local Ethics Committee of Trakya University by the number TÜTF-BAEK 2019/74.

2.8 Statistical Analysis

IBM SPSS Statistics 22 (IBM SPSS, Turkey) program was used for statistical analysis. While evaluating the study data, the chi-square test, Fisher's Exact test, Fisher Freeman Halton test, and Continuity (Yates) Correction were used for comparison of qualitative data and descriptive statistical methods (frequency). Significance was evaluated at the $p<0.05$ level.

3. RESULTS

3.1 Demographic Data

Three hundred fifty participants were recruited for this study. Their socio-demographic characteristics are displayed in Table 1.

There were more females (60.6%) than males (39.4%), with most of the participants being between the ages of 31–40 (n=100) and the highest number of education groups consisting of university graduates (37.1%) (Table 1).

Table 1.

Demographic Informations of The Participants

		n	%
Age	18-24	67	19,1
	25-30	37	10,6
	31-40	100	28,6
	41-50	70	20
	51-64	62	17,7
	65	14	4
Gender	Female	212	60,6
	Male	138	39,4
Education	Primary school	74	21,1
	Secondary school	33	9,4
	High school	88	25,1
	University	130	37,1
	Post graduate	25	7,1

3.2 Antibiotic Usage Behavior of The Participants For The Last Year

46 % of the participants stated that they have used antibiotics 1–2 times, 20.9% 3–4 times, 7.7% 5 or more times in the last year and the rate of participants who never used is 25.4%. Of the 261 participants who used antibiotics in the last year, 41.8% stated that they used antibiotics due to the common cold, 38.3% toothache, and 24.1% sore throat (Figure 1).

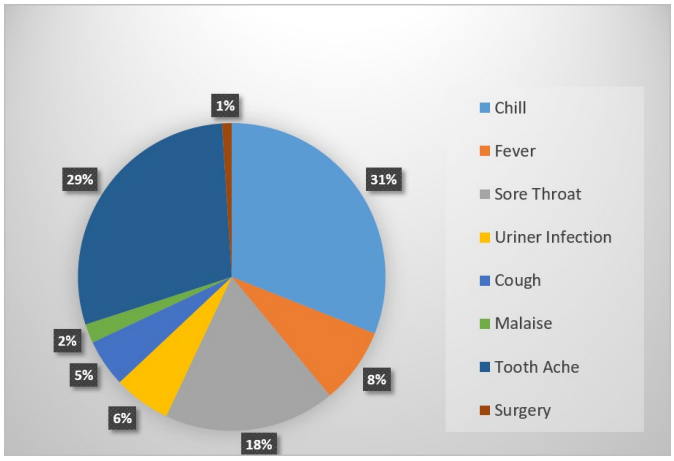

Figure 1

Antibiotic useage reasons of the patients in the last year

3.3 Thoughts and Behavior of Patients On General Antibiotic Use

The rate of self-treatment with antibiotics was 31.7% (n=111) and 33.3% of these participants stated that they used it for cold, 48.6% for toothache, and 25.2% for sore throat. In addition to these, the rate of asking for prescribing antibiotics without being sick and keeping them at home is 9.7% (n= 34) (Table 2).

Table 2.

Thoughts and Behaviors of Patients On General Antibiotic Use.

		n	%
Self medication without asking the doctor	Yes	111	31,7
	No	239	68,3
The reason for self medication (n=111)	Chill	37	33,3
	Fever	10	9
	Throat ache	28	25,2
	Uriner infection	9	8,1
	Cough	6	5,4
	Tooth ache	54	48,6
Ask to prescribe antibiotics without illness considering that it may be necessary	Yes	34	9,7
	No	316	90,3
Thoughts on the practice of pharmacies not selling antibiotics without a doctor's prescription	It shouldn't be sold.	305	87,1
	Simple antibiotics should be sold	23	6,6
	It must be sold	22	6,3
How to use antibiotics	Until I run out of medicine.	124	35,4
	Until my complaint stops	87	24,9
	Recommended by a doctor / pharmacist	139	39,7
Using antibiotics with the advice of social environment / asking a doctor to prescribe them	Yes	27	7,7
	No	323	92,3

87.1% of the participants stated that it is correct that pharmacies do not sell antibiotics without a doctor's prescription with current practices in Turkey. However, 6.3% think that it is difficult to see a doctor and get a prescription, and therefore it should be sold. While 35.4% (n=124) of the participants use antibiotics until the drug is finished, 24.9% (n=87) use them until the complaint stops and 39.7% (n=139) use them for the time recommended by the physician or pharmacist. 7.7% of the participants stated that they used antibiotics with the advice of their neighbors or relatives or asked the doctor to prescribe (n=27) (Table 2).

3.4 Thoughts and Behavior of Patients On the Use of Antibiotics in Dental Diseases

When it was evaluated, where the participants got information about the use of antibiotics in dentistry, 97.7% of them stated that they receive it from physicians and nurses, and the remaining part through social communication channels (tv, internet, etc). 19.7% (n = 69) of the participants were already using antibiotics when they applied to our clinic and 47 of them said that they were prescribed by a doctor at another center, and

the remaining 22 said that they started the antibiotics that were at home (Table 3).

Table 3.

Patients' Thoughts and Behaviors on The Use of Antibiotics in Dental Disorders

		n	%
Ongoing use of antibiotics	Yes	69	19,7
	No	281	80,3
Thought about antibiotic need before dental procedures	Yes	124	35,4
	No	226	64,6
Trust issues on dentists who don't prescribed antibiotics	Yes	69	19,7
	No	281	80,3
Thought of antibiotics for dental problems can be used in other infections	Yes	177	50,6
	No	173	49,4
Knowledge of the use of antibiotics before dental procedures in patients with heart disease	Yes	75	21,4
	No	261	74,6
	I'm not sure	10	2,9
	Doesn't sound relevant.	4	1,1
Knowledge of the use of antibiotics before dental procedures in patients with hip and joint prosthesis	Yes	42	12
	No	290	82,8
	I'm not sure	8	2,3
	Doesn't sound relevant.	10	2,9

When the participants were asked about their thoughts on using antibiotics before dental procedures, 35.4% (n=124) think that they should use antibiotics before any dental problems. When the dentist recommends a procedure without using antibiotics, 19.7% (n=69) of them have trust problems. 50.6% (n=177) of the participants think that antibiotics given in dental infections can also be effective in other infections such as flu, sinusitis, and bronchitis (Table 3). 21.4% (n=75) of the participants know using antibiotics before dental procedures in patients with heart diseases. Besides, the rate of participants who have information about the use of antibiotics before dental procedures in patients with hip and joint prostheses is 12% (n=42) (Table 3).

3.5 Examination of Antibiotic Use Attitudes and Behavior Among Age Groups

The rate of antibiotic use due to sore throat in the 31–40 age group (35.9%) was statistically significantly higher than the 51-64 age group (9.5%) and 65 years and over (0%) (p1:0.004; p2:0.011; $p<0.05$). There was no statistically significant difference between age groups in terms of other reasons for using antibiotics ($p>0.05$).

When the opinions of pharmacies not selling antibiotics without a doctor's prescription were examined among age groups, the rate of finding this application right in the 18–24 age group (97%) was statistically significantly higher than the groups between the ages of 25–30 (83.8%), 31-40 (%85) and 51-64 (77.4%) (p1: 0.029; p2: 0.047; p3: 0.002; $p<0.05$). The rate of finding pharmacies not to sell antibiotics without a physician's prescription correct for the 65 years and older groups is 92.9%.

When the rates of knowledge about the use of antibiotics before tooth extraction in patients with hip and joint prosthesis between age groups were examined; the rate of knowledge about this subject in the 18–24 age group (29.9%) was statistically significantly higher than the age groups 31–40 years old (4%), 41–50 years old (4.3%), 41–64 years old (6.5%) and 65 and over (0 %)(p:0.000; p:0.000; p:0.000; p:0.039; $p<0.05$). There was no statistically significant difference between age groups in terms of knowledge about the use of antibiotics before tooth extraction in patients with heart diseases ($p>0.05$).

3.6 Evaluation of Attitudes and Behavior Toward Antibiotic Use Among Genders

The rate of starting antibiotics without consulting a physician due to toothache in men (40%) was found to be statistically significantly lower than women (58.8%) (p:0.048; $p<0.05$). The rate of using the drugs given by the physician for the time recommended by the physician or pharmacist in men (45.8%) was found to be statistically significantly higher than women (30.4%) (p:0.016; $p<0.05$). Apart from these, no significant difference was found between male and female behavior in all parameters in our study.

3.7 Evaluation of Antibiotic Use Among Educational Backgrounds

When the relationship between educational status and the reasons for using antibiotics was investigated, common cold was found to be significantly lower in graduate students (10.5%) than other groups (p1:0.010; p2:0.002; p3:0.035; $p<0.05$) and statistically significantly higher for the sore throat in graduate students than the other groups (p1: 0.000; p2: 0.035; p3: 0.013; $p<0.05$). Similarly, the rate of using antibiotics due to sore throat among university graduates (32.2%) was statistically significantly higher than primary school graduates (8.8%) (p:0.002; $p<0.05$). Based on cough, the rate of antibiotic use among primary school graduates (0%) was found to be significantly lower than that of secondary school (18.5%), university (8.9%), and postgraduates (21.1%) (p1:0.003; p2:0.017; p3: 0.003; $p<0.05$). The rate of using antibiotics due to cough of high school graduates (2.9%) was also statistically significantly lower than those of secondary school graduates (18.5%) and postgraduates (21.1%) (p:0.019; $p<0.05$).

Among the educational backgrounds, the rate of using an antibiotic prescribed for another reason without a doctor recommendation was found to be statistically significantly lower in university graduates (20%) compared to high school graduates (46.6%) and postgraduates (44%) (p1:0.000; p2:0.020; $p<0.05$). Primary school graduates (31.1%) were also significantly lower than high school graduates (46.6%) (p:0.044; $p<0.05$).

When the ways of using the drugs were evaluated, the rate of using the time recommended by the physician or the pharmacist of secondary school graduates (27.3%) was found to be significantly lower than those of primary school (40.5%), university (42.3%) and postgraduates (56%) (p1:0.010; p2: 0.027; p3:0.017; $p<0.05$). There was no significant difference between the other education levels in terms of distribution rates of the drugs given by the physicians ($p>0.05$). The rate of having confidence problems (13.1%) when the dentist recommends tooth extraction without using antibiotics for university graduates was found to be significantly lower than those of primary school (25.7%) and secondary school graduates (33.3%) (p1:0.038; p2:0.013; $p<0.05$).

When the rate of knowledge about the use of antibiotics before tooth extraction in patients with heart disease is examined; primary school graduates (10.8%) was found to be statistically significantly lower than university graduates (29.2%) and postgraduates (48%) (p1:0.006; p2:0.000; $p<0.05$). Also, the rate of high school graduates to know this subject (10.2%) was found to be significantly lower than university graduates (29.2%) and postgraduates (48%) (p1:0.001; p2:0.000; $p<0.05$).

Considering the rate of knowledge about the use of antibiotics before tooth extraction in patients with hip and joint prosthesis among education levels, primary school graduates (2.7%) were significantly lower than university graduates (20%) and postgraduates (36%) (p1:0.001; p2:0.000; $p<0.05$). The rate of knowledge about this subject for high school graduates (3.4%) was found to be significantly lower than that of the university (20%) and postgraduates (36%) (p:0.000; $p<0.05$). (Table 4)

Table 4. Evaluation of Information on Antibiotic Use Among Educational Backgrounds

		Education					p
		Primary School	Secondary School	High School	University	Post Graduate	
		n (%)	n (%)	n (%)	n (%)	n (%)	
Reason for using antibiotics	**Common cold**	**21 (36,8)**	**14 (51,9)**	**37 (54,4)**	**35 (38,9)**	**2 (10,5)**	**[1]0,007***
	Fever	3 (5,3)	1 (3,7)	8 (11,8)	15 (16,7)	0 (0)	**[1]0,059**
	Sore throat	5 (8,8)	5 (18,5)	14 (20,6)	29 (32,2)	10 (52,6)	**[1]0,001***
	Urinary infection	7 (%12,3)	1 (%3,7)	4 (%5,9)	5 (%5,6)	4 (%21,1)	**[2]0,126**
	Cough	0 (0)	5 (18,5)	2 (2,9)	8 (8,9)	4 (21,1)	**[2]0,001***
	Malaise	0 (%0)	2 (%7,4)	0 (%0)	5 (%5,6)	1 (%5,3)	**[2]0,038***
		30 (52,6)	11 (40,7)	22 (32,4)	33 (36,7)	4 (21,1)	**[1]0,074**
	Surgery	0 (0)	1 (3,7)	0 (0)	2 (2,2)	1 (5,3)	**[2]0,138**
Self-medication	Yes	23 (31,1)	10 (30,3)	41 (46,6)	26 (20)	11 (44)	**[1]0,001***
	No	51 (68,9)	23 (69,7)	47 (53,4)	104 (80)	14 (56)	
How to use medications	Until I run out of medicine.	31 (41,9)	9 (27,3)	30 (34,1)	46 (35,4)	8 (32)	**[1]0,047***
	Until complaint stops	13 (17,6)	15 (45,5)	27 (30,7)	29 (22,3)	3 (12)	
	Recommendation	30 (40,5)	9 (27,3)	31 (35,2)	55 (42,3)	14 (56)	
Having a trust problem when a dentist recommends tooth extraction without using antibiotics	Yes	19 (25,7)	11 (33,3)	19 (21,6)	17 (13,1)	3 (12)	**[1]0,036***
	No	55 (74,3)	22 (66,7)	69 (78,4)	113 (86,9)	22 (88)	
Knowledge of the use of antibiotics before dental procedures in patients with heart disease	Yes	8 (10,8)	8 (24,2)	9 (10,2)	38 (29,2)	12 (48)	**[1]0,000***
	No	64 (86,5)	25 (75,8)	76 (86,4)	85 (65,4)	11 (44)	
	Not sure	1 (1,4)	0 (0)	3 (3,4)	4 (3,1)	2 (8)	
	Not relevant	1 (1,4)	0 (0)	0 (0)	3 (2,3)	0 (0)	
Knowledge of the use of antibiotics before dental procedures in patients with hip and joint prosthesis	Yes	2 (2,7)	2 (6,1)	3 (3,4)	26 (20)	9 (36)	**[1]0,000***
	No	69 (93,2)	30 (90,9)	84 (95,5)	93 (71,5)	14 (56)	
	Not sure	2 (2,7)	0 (0)	0 (0)	5 (3,8)	1 (4)	
	Not relevant	1 (1,4)	1 (3)	1 (1,1)	6 (4,6)	1 (4)	

[1]Ki-Kare Test *[2]Fisher Freeman Halton Test* **p<0.05*

4. DISCUSSION

This study investigated the antibiotic using behaviors of patients who were referred to dentistry faculty in Edirne, which represents an incision of one of the relatively young and highly educated cities in Turkey[5]. Self-medication is the most well-known reason for the development of antibiotic-resistant bacteria and diseases[6]. The high rate of unnecessary and inappropriate use of antibiotics, which causes antimicrobial resistance, is a worldwide public health problem[2]. Diseases that occur and spread due to self-medication are a serious problem that negatively affects not only the life of the patients but also the entire healthcare system[1,7]. Studies conducted in Europe have recently shown higher rates of outpatient antibiotic use and resistance[8,9]. Globally, many studies

and meetings are held in cooperation with both public institutions and non-governmental organizations to increase public knowledge about self-medication and antibiotic misuse for preventing individual mistakes. In this regard, WHO recommended regular checks by targeting patients, prescribing physicians, countries' health systems, and pharmaceutical industries[10].

4.1 Easy Access to Antibiotics

One of the main factors leading to antibiotic misuse is easy access. Many studies have shown that the rate of antibiotic use is higher in low- and middle-income countries where getting the drugs are informal[9,11-13]. Okeke et al.[14] reported that in less developed countries most of the antibiotic use occurred with antibiotics obtained outside the hospital without a prescription. Since 2013 pharmacies are strictly prohibited from selling antibiotics without a doctor's prescription in Turkey. For this reason, comfortable access to antibiotics was not thought to be among the reasons for misuse in this study. Also, 87.1% of the participants' statement that over-the-counter antibiotics is incorrect, confirms the view.

4.2 Antibiotic Prescription Request of The Patient

"Asking the doctor to write a prescription," is another problem in clinical practice. In this study, 6.3% (n=22) of the participants stated that they thought it is difficult to get a doctor's examination and therefore antibiotics should be sold without a prescription. With a similar ratio, the rate of using antibiotics with familiar advice or asking the doctor to prescribe it is 7.7% (n=27). Although the results in this study seem to be relatively low, the antibiotic demands of patients in clinical practice pose a huge problem for all dentists. Al- Azzam et al.[15] stated that the most important reason leading to self-medication was the previous positive outcome and that the patients did not want to deal with treatment other than the antibiotic that was good for them before. At this point, prescribing behaviors of physicians are as important as the education and knowledge level of the patients. In addition, the problems in the healthcare system of countries and the difficulties of being examined by doctors are situations that should be solved by the governments.

4.3 Frequency of Using Antibiotics

To understand the antibiotic use behavior of patients, first, it is necessary to evaluate the frequency of antibiotic use. In our study, the rate of using antibiotics at least once in the last year was 74.6%. Skliros et al.[9] stated in their large-area survey study that the use of antibiotics within the past 12 months was 77.9% and concluded that the result was consistent with previous studies. These findings show that the rate of antibiotic use of patients is high. When the reasons for antibiotic use are examined, the results of this study showed the rate of chill and fever is 52.1%, the rate of sore throat is 24.1%, and the rate of use of antibiotics due to toothache is 38.3%. The high rate of antibiotic use due to toothache in this study is probably because the study was conducted in a dental hospital. Additionally, antibiotics using rates obtained due to fever and respiratory diseases follow the previous studies[1,16,17].

4.4 The Most Common Self-Medication Diseases

It is also important to understand in which disease patients use self-medication. In literature, it is seen that patients start antibiotics themselves in cases of sore throat, common cold, and fever[9,10,18,19]. In a survey study by Haque et al.[16] among medical students, it was stated that a small group used 2–6 times non-prescription antibiotics in the last year and the reasons for self-prescribing were common cold, cough, sore throat, similar to previous studies. In our study, the rate of using antibiotics prescribed for another reason without asking the doctor was 31.7%, which is relatively high. While 58.5% of patients who take self-medication reported upper respiratory tract disorders as a reason, the rate for toothache is 48.6%. In the literature, there is no questionnaire investigating self-medication on antibiotic use in dental centers. The high rate in our study is probably related to the fact that the study was conducted in a dentistry faculty but also to a low level of knowledge about dental infections and antibiotic usage. For example, according to the results of our study, 50.6% of the participants stated that they think that antibiotics given for dental infections can also be effective in infections such as flu, sinusitis, and bronchitis. This is a notion that has no validity in medical practice. Additionally, one of the most common situation faced by dentists is that patients are already using antibiotics, mostly unconsciously, when they come to the clinic, or they request to use antibiotics before the procedure. According to our survey results, 35.4% of the participants think that they should use antibiotics before dental procedures and 34.7% of them have confidence problems when the dentist recommends tooth extraction without using antibiotics. However, as in other branches, antibiotics are not used for every pain or infection in dentistry. Another mistake is to stop taking the drug once the pain relief. The investigation of the duration of antibiotic use of the patients in this study showed that 24.9% (n=87) of the participants stop using the drugs when their complaints stop. Considering that most of the participants are young patients, this finding reveals that it is necessary to inform the public about antibiotic resistance and its unfavorable effects that may occur in the future.

4.5 Keeping Antibiotics at Home

Keeping antibiotics at home has also been reported as a major problem contributing to antibiotic misuse[20,21]. As a result of a systematic review and meta-analysis with 16755 subjects from nine studies by Kardas et al.[22], it is reported that one-quarter of the

patients had leftover antibiotics for future use, and they stated that this result reflects a widespread pattern of poor antibiotic-taking and prescribing behavior. In our study, the rate of prescribing antibiotics for future use and keeping at home in case of need among the participants was 9.7%, quite in line with previous studies. At this point, prevention methods can be taken such as regulating and guiding physicians, especially inexperienced physicians on over-prescribing, training patients to use the prescribed antibiotic exactly as the physician says, and penalizing pharmacies in case of selling over-the-counter antibiotics[21].

4.6 Information Resource About Antibiotics

97.7% of the participants stated that they received information about the use of antibiotics in dentistry from physicians and nurses. Since the branch of dentistry is one of the operational parts of medical science, although there is a lot of speculative discourse on it, there is no solution other than experts in the main disease condition. A basic knowledge of dental procedures is antibiotic prophylaxis in some heart diseases and patients with joint prostheses. Bacteraemia developing after dental procedures is a predisposing factor for infectious endocarditis, which is a devastating disease with high mortality.[23] Similarly, in patients with hip and joint prostheses, it is thought that antibiotics should be recommended according to some criteria such as the time elapsed since the joint replacement, the type of dental procedure to be performed, and systemic condition of the patient[24]. In our study, 21.4% of the participants were aware of the use of antibiotics before tooth extraction in patients with heart disease, but no significant difference was found in terms of demographic information. Similarly, the rate of participants who know the use of antibiotics before tooth extraction in patients with hip and joint prostheses is 12%, and the majority of this group (29.9%) is between the ages of 18–24. Although many studies in the literature measure physicians' experience and behaviour on these issues, there is no study that measures patient knowledge. For this reason, no comparison could be made, but the small number of patients with information about heart diseases may be due to the small number of patients over 65 years old among the participants. In addition, the fact that the young population access information faster, especially with the use of the internet, and that they are constantly in contact with health warnings, may explain that they have more information on a subject that does not concern them much, except in special cases. Apart from these, in this study, the general knowledge level and behaviour patterns of the patients were investigated without evaluating the systemic status. It is recommended to examine the level of knowledge and awareness on this important issue with further studies in which individuals with relevant patient groups are included.

4.7 Behavioral Patterns According to Gender

In our study, when it was evaluated whether there was a difference between the antibiotic use behavior between genders, the rate of self-starting antibiotics due to toothache in men (40%) was found to be statistically significantly lower than that of women (58.8%) and the rate of compliance with the times of drug use was again found to be significantly higher (45,8%). Other studies have also shown that men are more cooperative in using drugs[1,25,26]. The fact that women pay more attention to their health than men causes the rate of diagnosis and treatment to be higher in this gender. Additionally, women's anatomical, physiological and hormonal structures make them more prone to infections.[1,27] Mor et al.[28] reported that antibiotic use differs significantly by gender in their international study with approximately 29 million adults in European countries. Similarly, a study conducted in the Netherlands stated that antibiotic use is higher in women, regardless of urban and rural populations[29].

4.8 Behavioral Patterns According to Educational Status

5. LIMITATIONS OF THE STUDY

This study is a cross-sectional survey study conducted in only one faculty of dentistry in Turkey. Other studies involving random sampling from patients from other dental faculties are also needed to obtain cohort results. Edirne, the city where the study was conducted, is a city with relatively young, educated, and high levels of income in Turkey, so the study does not include evaluation in terms of different education and income levels. In addition, the number of patients aged 65 and over is low in our study. Further studies involving more numbers of this particular group of patients may give more objective results about the level of knowledge of patients with heart diseases and joint prostheses.

6. CONCLUSIONS

The results of our study show that misuse behavior of antibiotics are still high. Even the most educated are prone to self-medication and are not sufficiently informed or sensitive about the dangers of antibiotic resistance. When evaluated in terms of dentistry, it is a great handicap for patients to self-medicate and use antibiotics that do not work in dental infections without asking the doctor. In addition, the general idea that procedures without antibiotics will spread the infection complicates the clinical practice of dentists. This study examined the antibiotic usage behavior of the patients with questions specific to dentistry and revealed the importance of education of the general public about antibiotic usage generally but also in dentistry. Further studies with higher participants are

recommended to explore more deeply into people's health beliefs and knowledge about antibiotic use.

Author Contributions

Author Nilay Er is responsible for the conception, design, analysis, and interpretation of data and drafting of the paper.

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Declaration of interest

None

Ethical approval

All procedures performed in studies involving human participants were following with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards

Informed consent

Informed consent was obtained from all individual participants included in the study.

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