

ORIGINAL  
ARTICLE

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Received: 21.02.2019  
 Acceptance: 05.10.2019  
 DOI: 10.18521/ktd.530416

**Konuralp Medical Journal**  
 e-ISSN1309-3878  
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## Evaluation of the Knowledge, Attitudes, and Behaviors of Antibiotics Usage at the Parents Living in the Aegean Part of Turkey

### ABSTRACT

**Objective:** Antibiotics are considered to be one of the greatest discoveries of the 20th century. The widespread and inappropriate use of antibiotics leads to resistance to microorganisms, increased cost, and at the same time an increase in the incidence of secondary side effects. We aimed to determine the knowledge, attitudes, and behaviors about the use of antibiotics of the parents living in the Aegean part of Turkey.

**Methods:** The study was conducted with parents of 252 children who applied to the Kutahya Family Health Center between May and October 2017. The data were collected by face-to-face interview using a questionnaire survey prepared by the investigator. Descriptive and categorical statistics were used for the study. Categorical variables were compared using the Chi-square test. The level of statistical significance was set at  $p < 0.05$ .

**Results:** The mean age of parents was  $32.83 \pm 7.61$  years and most of them were in a low education and income group. There was negative correlation between education level and use of correct antibiotics ( $p < 0.01$ ). This sentence given by you is like a interpretation and should be in a conclusion or discussion. Additionally, the correct level of knowledge of parents living in the urban area, male gender, and unemployed was determined to be lower.

**Conclusions:** Rational antibiotic use is an important health issue in our country. We anticipate regional differences in evaluations of antibiotic use and we believe that, in order to increase the efficiency of antibiotic use, it is necessary to increase the level of education in the region and to reprogram health education to the public. Family Doctors should be sensitive to the use of antibiotics and inform the patient during the interview process. We believe that guidance and strategy can be developed for the national-international correct use of antibiotics using these regional data that we have obtained.

**Keywords:** Antibiotic, Parents, Turkey, Knowledge, Attitude.

## Türkiye Ege Bölgesinde Yaşayan Ebeveynlerin Antibiyotik Kullanımına İlişkin Bilgi Tutum ve Davranışlarının Değerlendirilmesi

### ÖZET

**Amaç:** Antibiyotikler, 20. Yüzyılın en büyük keşiflerinden biri olarak kabul edilir. Yaygın ve uygun olmayan antibiyotik kullanımı, mikroorganizmalara karşı direnç, artan maliyet ve aynı zamanda ikincil yan etkilerin görülme sıklığında artışa yol açmaktadır. Türkiye'nin Ege bölgesinde yaşayan ebeveynlerin antibiyotik kullanımı ile ilgili bilgi, tutum ve davranışları belirlemeyi amaçladık.

**Gereç ve Yöntem:** Araştırma, Mayıs ve Ekim 2017 tarihleri arasında Kütahya Aile Sağlığı Merkezine başvuran 252 çocuğun ebeveynleri ile yapıldı. Veriler, araştırmacı tarafından hazırlanan anket formu kullanılarak yüzyüze görüşülerek toplandı. Tanımlayıcı ve kategorik istatistikler bu çalışmada kullanılmıştır. Kategorik değişkenler Ki-kare testi kullanılarak karşılaştırıldı. İstatistiksel anlamlılık düzeyi  $p < 0.05$  olarak belirlendi.

**Bulgular:** Ebeveynlerin yaş ortalaması  $32.83 \pm 7.61$  yıl idi ve çoğu eğitim ve gelir düzeyi düşük olan gruptaydı. Eğitim seviyesi arttıkça, doğru antibiyotik kullanımının önemli ölçüde azaldığını bulduk. Ayrıca, kentsel alanda yaşayan ebeveynlerin, erkek cinsiyetin ve işsizlerin doğru bilgi düzeyinin daha düşük olduğu belirlenmiştir ( $p < 0.01$ ). Antibiyotik kullanımı ile ilgili tutum ve davranışların sorulduğu sorularda ise doğru davranış oranı daha yüksek bulunmuştur.

**Sonuç:** Akılcı antibiyotik kullanımı ülkemizde önemli bir sağlık sorunudur. Antibiyotik kullanımının değerlendirilmesinde bölgesel farklılıkları öngörüyoruz ve antibiyotik kullanımının etkinliğini arttırmak için bölgedeki eğitim seviyesini arttırmanın ve sağlık eğitimini halka yeniden programlamanın gerekli olduğuna inanıyoruz. Aile Hekimleri, doğru antibiyotik kullanımı konusunda duyarlı davranmalı ve bilgilendirmeye zaman ayırmalıdır. Elde ettiğimiz bu bölgesel verileri kullanarak ulusal ve uluslararası antibiyotiklerin doğru kullanımı için rehberlik ve stratejinin geliştirilebileceğine inanıyoruz.

**Anahtar Kelimeler:** Antibiyotik, Ebeveynler, Türkiye, Bilgi, Tutum.

## INTRODUCTION

Antibiotics are considered to be one of the greatest discoveries of the 20th century. High mortality and morbidity due to infectious diseases have decreased rapidly after antibiotics have been found (1).

Although it is known that the majority of febrile illnesses are due to viral factors in the childhood age group, antibiotics are often improperly used because of the frequent occurrence of febrile illnesses. The widespread and inappropriate use of antibiotics leads to resistance to microorganisms, increased cost, and at the same time an increase in the incidence of secondary side effects (2). The World Health Organization describes the use of appropriate antibiotics as "The cost-effective use of antibiotics with a clinical efficacy maximum, minimum drug-related side effects, and risk of developing antimicrobial resistance" (3). The use of antimicrobial agents, especially antibiotics, in the treatment of pediatric patients has become routine practice (4).

Multiple clinical trials support the belief that parents' use antibiotics for colds and coughs. Educational initiatives should include both doctors and parents because the patient's antibiotic request should be well described if it is real or perceived. If this step cannot be evaluated well it can cause an inappropriate prescribe even if it is real (5).

Parent education should be one of the main objectives of antibiotic usage in children. Although studies have proven that the positive effects of education on the use of antibiotics, training should be continuous to make this behavior permanent. The establishment of public education programs requires the examination of the false beliefs and information as like as the pressure of the physician prescribing, the use of antibiotics with the appropriate dosage and duration, during the period and obeying the doctor's recommendation or not (6).

The knowledge and attitudes of people about using antibiotics are influenced by many factors. Especially, regional differences such as education and income level are the main determinant of socioeconomic factors. In this context, we aimed to determine the knowledge, attitudes, and behaviors about the use of antibiotics of the parents living in Kütahya province situated in the Aegean part of Turkey. We believe that the information we have obtained may be a source for increasing the effectiveness of antibiotic use in target population-specific and also similar socio-demographic constructs.

## MATERIAL AND METHODS

**Location and Time of the Study:** The study was conducted with parents of 252 children who applied to the Kütahya Family Health Center between May and October 2017.

## The Universe of Research and Sampling:

The study's universe constitutes 2045 patients registered to the Kütahya Family Health Center. Parents of 252 children who applied to our center for different reasons during the study period were included in the study.

The sample volume was calculated as  $p = 0.50$  to 252 at 95% confidence interval, 5% error rate, and prevalence unknown. The sample of the study was selected from parents who were at least one child in preschool age, who agreed to participate in the study, who were literate, able to understand and answer questions. Children with chronic disease, such as immunodeficiency, diabetes, cystic fibrosis, chronic renal failure, malabsorption syndromes, or frequent antibiotic use, were excluded from the study.

**Collection of Data:** The data were collected by the face-to-face interview about the socio-demographic and antibiotic use of the parent and the child via a questionnaire survey which was prepared by the investigator. The questionnaire used to collect data included sections to understand sociodemographic variables as well as attitude towards antibiotic use. The age, gender, education level, family income level, occupation, number of children in the family, number of people living at home and the presence of chronic disease in the child were asked about sociodemographic characteristics. Questions were asked about parental attitudes towards antibiotic use. These questions tried to evaluate the correct knowledge and attitude levels of the participants. When preparing the questions, they were re-organized by the researchers in line with the life and traditions of the society by taking advantage of the previous studies in the literature or they were taken in some questions (1,2,4,5).

**Statistical Analysis:** Data were entered in MS Excel. Responses were coded and analyzed using SPSS version 10.0. Descriptive and categorical statistics were used for the study. Categorical variables were compared using the Chi-square test. The level of statistical significance was set at  $p < 0.05$ .

## RESULTS

252 parents participated in the study. The mean age of the parents was  $32.83 \pm 7.61$  years old (min: 18, max: 58 years old). The mean age of the children ranged was  $9.62 \pm 5.65$  years old (min: 0, max: 17 years old).

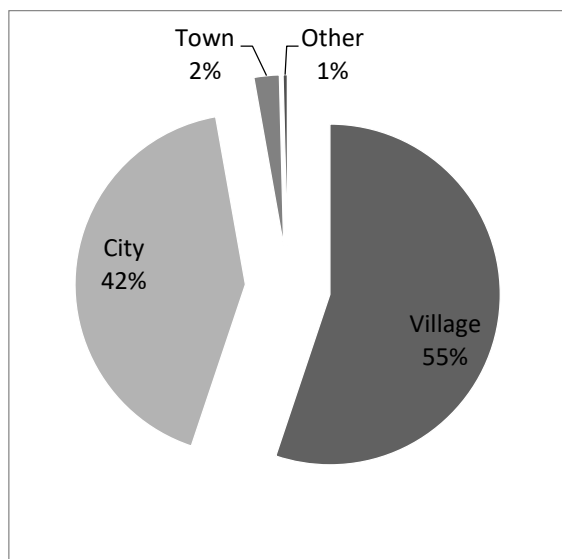
Table 1 summarizes the socio-demographic data related to the sex, age, educational status, place of residence, profession, income level, number of

children, number of people living at home and children's chronic illness. Concentrated distribution points for each group are indicated in bold.

**Table 1.** Distribution Socio-demographic Characteristics of Parents

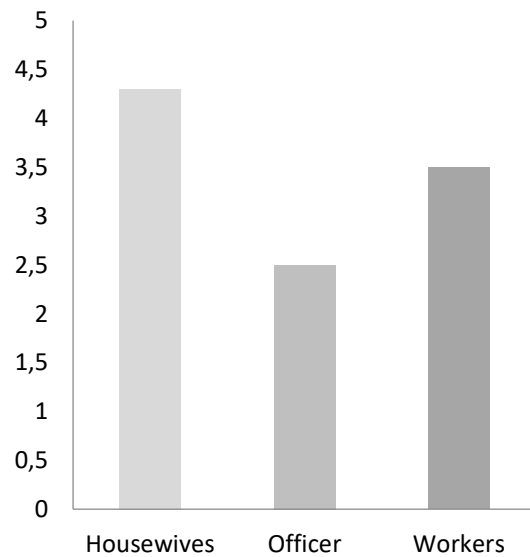
		N	%
<b>Gender</b>	Female	204	<b>81</b>
	Male	48	19
<b>Age Groups</b>	Under 25	46	18,3
	Between 25 and 35	121	<b>48</b>
	Above 35	85	33,7
<b>Education Status</b>	Secondary education	173	<b>78,6</b>
	High school	35	13,9
	University	44	17,5
<b>Place to Live</b>	Rural	139	<b>55,2</b>
	Urban	113	44,8
<b>Job</b>	Working	77	30,6
	Unemployed	175	<b>69,4</b>
<b>Income rate</b>	Under 2000 TL	177	<b>70,3</b>
	Above 2000 TL	75	29,7
<b>Number of children</b>	One	64	25,4
	2	119	<b>47,2</b>
	3	49	19,4
	4	18	7,1
	Over 4	2	0,8
<b>Number of people living at home</b>	4 and below	166	<b>65,9</b>
	Over 4	86	34,1

The distributions of places where parents live according to their administrative characteristics were observed as; 139 (55.2%) in the village, 106 (42.1%) in the city, 6 (2.4%) in the town and 1 (0.4%) other (Figure 1).



**Figure 1.** Frequency of distributions of parents by place of residence

According to the parents' profession, it was determined that 175 (69.4%) people were housewives with the majority, 36 (14.3%) were officer and 41 (16.3%) were workers without sex discrimination (Figure 2).



**Figure 2.** Frequency of occupational distributions of parents.

The answers to the questions of parents' knowledge, attitudes and behaviors regarding antibiotic use were as follows;

"How many times have you used antibiotics in the last 1 year? " 51.6% never "What is the most

common cause of using antibiotics? " 46.8% flu-diarrhea-bronchitis-other than skin infections,

Questions about Parents' knowledge, attitude, and behavior regarding antibiotic use are shown in Table 2.

**Table 2.** Parents' knowledge, attitudes, and behaviors regarding antibiotic use

	Yes(%)
Do you use antibiotics in your child in the last 1 year?	79,8
Did you hear the term antibiotic resistance?	44,4
Do you know the purpose of antibiotic use?	78,6
Do you think your antibiotics will harm your children?	80,6
Do you know the side effects of antibiotics?	31,3
Did you have a fever in the last year?	16,7
Have you used antibiotics other than doctors advice?	0,8
Does your child have a drug allergy?	7,1

Other questions and related results in the same questionnaire were evaluated by parents as accurate levels of information on antibiotic knowledge and use (Table 3).

The relationship between the level of correct knowledge of parents' use of antibiotics and their socio-demographic characteristics have been assessed. We found that as the level of education increased, the use of correct antibiotics decreased significantly.

Also, the correct level of knowledge of parents living in the urban area, male gender, and unemployed was determined to be lower. The sentences should not be started with "we found that...". The correct way to report the results is "there was a negative correlation between....." in the results section and the statistical values should given. In addition, there are more results in the tables, you should write more results in this section. (p<0.01) (Table 4).

**Table 3.** Parents' accurate knowledge of antibiotic and use.

	N	%
<b>Which microorganisms are affected by antibiotics?</b>	141	56
<b>Do every febrile illness require antibiotics?</b>	218	86,5
<b>How long is the period of antibiotic use?</b>	159	63,1
<b>Would you change the prescribed antibiotic dose?</b>	238	94,4
<b>Will the cold get better without taking antibiotics?</b>	183	72,6
<b>Do you use antibiotics yourself for your child in case of illness?</b>	242	96
<b>Do you use antibiotics for yourself without a doctor's advice?</b>	229	90,9

**Table 4.** The relationship between the level of correct knowledge of parents' use of antibiotics and their sociodemographic characteristics

		Level of Knowledge for Antibiotic Use				Significance <i>p</i>
		Correct		Incorrect		
		N	%	N	%	
<b>Gender</b>	<b>Woman</b>	85	41,7	119	58,3	0.001**
	<b>Male</b>	8	16,7	40	83,3	
<b>Education Status</b>	<b>Secondary</b>	77	44,5	96	54,2	0.002**
	<b>High school</b>	7	20,0	28	80	
	<b>University</b>	9	20,5	35	79,5	
<b>Place to Live</b>	<b>Rural</b>	60	41,1	86	58,9	0.106
	<b>Urban</b>	33	31,1	73	68,9	
<b>Job</b>	<b>Working</b>	81	46,3	94	53,7	0.000**
	<b>Unemployed</b>	12	15,6	65	84,4	
<b>Income Level</b>	<b>Under 2000 TL</b>	71	40,1	106	59,9	0.105
	<b>Above 2000 TL</b>	22	29,3	53	70,7	

\*\* Statistical significance was determined as p <0.001 (Chi-square test).

## DISCUSSION

Improper use of antibiotics leads to an increase in the rate of side effects as well as increased antibacterial resistance, treatment failure, and cost increase. Therefore, the "rational use of antibiotics", which we can define as antibiotics in the right patient with the right indications, at the correct dose interval and at the right time, seems to be the most appropriate strategy to slow down the increase of antibiotic resistance (7-9).

Parents do not give the prescribed antibiotic as recommended, and they use antibiotics without consulting the doctor. Therefore, in addition to physicians, other factors as like as family factor play an important role in the rational use of antibiotics (3). While many studies examining attitudes and behaviors of only mothers affecting the use of rational antibiotics in children were included, both mothers and fathers were included in our study (10, 11). We have observed that the level of accurate knowledge of antibiotic knowledge and use of fathers was significantly lower than of mothers.

As the sociodemographic characteristics of parents were examined, it was seen that most of them were in the age group of 25-35 years old, with education level at the secondary level and not working. When we examine the relationship between parents' accurate level of knowledge and use of antibiotics and their demographic characteristics in our study, gender, educational status, occupational aspects were found statistically significant. Studies in the literature on the use of rational antibiotics by parents have been examined, but no gender-related comparative statement has been found (12). We have observed that the statistical significance in terms of sex is due to the fact that the attitude toward antibiotic use in women is more accurate. In other studies, it was determined that the level of consciousness of using antibiotics increased with the level of education of parents (13,14). Unlike the literature, we found that as the level of education increased, the use of correct antibiotics decreased significantly. We are thinking about the wrong and inadequate informing of educated people about health can cause this result.

In general, the disappearance of complaints related to infection suggests that the period of use of antibiotics on the public is sufficient. In the study conducted on this subject, it has been found that 85% of the mothers stop antibiotics usage when their children stop complaining (15). In our study, this rate was determined as 63.1%. Despite the low level of education of participants, the use of appropriate antibiotics has been linked to informing patients appropriately.

As far as we have observed, there is no study in the literature that shows the relation between the working status of the families and the correct use of antibiotics. The majority of parents who participated

in our work were unemployed. When we examine the relationship between occupation and the correct use of antibiotics by parents, we have seen that the working group significantly more accurately uses antibiotics.

In one study, physicians stated that patient claim was an important reason to prescribe antibiotics. It has also been observed that parents' actual or perceived expectations influence antibiotic prescribing (16). In a study conducted by Rousounides et al. in 2011, misdiagnosis of antibiotics was shown not to be mediated by the parental pressure, but physicians said that most of the parents wanted antibiotic treatment for upper respiratory tract infection. For this reason, both parents and physicians need simultaneous well-structured interventions to improve antibiotic use (13). Only 9.6% of the parents of our study stated that they used drugs without doctor's advice. There is no evidence if there is any request for antibiotics prescribing.

In one study, approximately 40% of the parents had average knowledge. In the study of Idrizine, parents responded to the question about the use of antibiotics in bacterial infections at the highest rate (4). In our study, we have observed similar results.

In our study, when the right information and attitudes about parents' use of antibiotics were evaluated, it was observed that the level of knowledge was low and interestingly attitudes were correct. For example, the correct answer to the question "Antibiotics are protective against which microorganisms?", that we regard as a specific question about antibiotics, is 56%. This result can be regarded as a sign that the level of antibiotic knowledge in the studied population is low. We have observed that the level of education is low in socio-demographic terms. Thus, the observed result we obtained in our study group is an expected result. In a study conducted in the literature, it has been found that about 25% of people recommend antibiotic treatment without medication or some medications that they think are good for themselves (2). In our study, the parents start antibiotic usage according to doctor recommendation for their children and for themselves 96% and 90.9%, respectively. At the same time, it was determined that 94.4% of the parents did not change the prescribed antibiotic dose. Despite the low level of education and knowledge of our population, these attitudes towards antibiotic use are noteworthy. We can say that the health workers in the region correctly inform the patients and their relatives.

## CONCLUSION

Proper antibiotic use is one of the most important strategies to prevent the development of resistance throughout the hospital and to reduce the

cost. The correct use of antibiotics is important for each patient and a group of patients and at the same time is influenced by many factors. The education and income levels, which are considered to be the most important of these factors, are shaped according to the regions where the target population lives. For this reason, we anticipate regional differences in evaluations of antibiotic use and we believe that, in order to increase the efficiency of antibiotic use, it is necessary to increase the level of education in the region and to reprogram health education to the public. We believe that guidance can be drawn up using these regional data we have obtained and that a strategy for the national-international correct use of antibiotics can be developed.

**Acknowledgment:** We would like to present our special thanks to Dr. Betül Marangozoğlu, for her scientific contribution.

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**Authors' contributions:** Yasemin Korkut conceptualized and all the authors designed the study. Alime Emre had the main responsibility for the collection of data. Ceylan Ayada did statistical analyses and wrote the methods and results. Yasemin Korkut wrote the drafts of the introduction and discussion. Ceylan Ayada revised the drafts. All the authors approved the final manuscript as submitted.

**Compliance with Ethical Standards:**

**Conflicts of Interest:** The authors declare that they have no conflict of interest.

**Ethical Approval:** The study protocol conforms to the ethical guidelines of the Declaration of Helsinki and was approved by the Clinical Research Ethics Committee of Dumlupınar University.

**Informed Consent:** All of the procedures were explained to the subjects and written informed consent forms were obtained from all participants.