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KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING ANTIBIOTICS USE AMONG PARENTS FOR THEIR CHILDREN

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ABSTRACT: Introduction: Antibiotics are used to perish the growth of bacteria. Undesirable use of antibiotics is presently common all over the world. Parent's knowledge and attitudes towards antibiotics play a vital role in the success of treatment process. Due to lack of knowledge, sometimes antibiotics are badly used for the treatment of infection. Study aims to evaluate the knowledge, attitude and practices regarding antibiotics use among parents for their children. **Methodology:** A cross-sectional study design was adapted, using convenient sampling technique in different areas of Lahore, Pakistan during the period June -2017 to November- 2017 by using a self-administrated questionnaire, involving 400 participants. Those mothers or fathers were included which had children under 5 years of age. **Results:** Results showed that 92(23%) of the respondents had poor knowledge, 252(63%) had moderate knowledge and 44(11%) had good knowledge. Significant associations were found between knowledge statements and age, number of children, education and spouse education. Significant associations were also found between attitude statements and age, gender, number of children, education and spouse education. Whereas significant associations were found between practice statements and gender, number of children, education and spouse education. Significant association was found between knowledge about antibiotics & education level ($P < .001$), and also between attitude about antibiotics & education level ($P=0.005$). **Conclusion:** The survey revealed that there is a diversity of public awareness about antibiotics and microbiological resistance on the basis of socio-demographic factors. The misuse of antibiotics is an important issue in public health which affects the society and individual people.

INTRODUCTION: The agents which can destroy or inhibit the growth of pathogenic microorganisms and are used in the treatment of external or internal infections are called antibiotics and the use of these chemical agents has tremendously increased in the World¹. The antibiotics can play a pivotal role in the eradication of bacterial infections because antibiotics help in lessening the death rate in children all over the World².

Rogawski (2017) accepted that bacterial infection can be treated with antibiotics and this can prove to be a life saving treatment for children. According to him, antibiotics were most commonly medicine prescribed for the children. However, this fact still exists that the excessive use of antibiotics consequent upon the adverse effects like lethal drugs, harmful effects on the gut micro biota and the enteric immune system³.

According to WHO report, entitled "antimicrobial resistance global report on surveillance" common infections and minor injuries can kill in post antibiotic era is far from being a prophetic fantasy. The antibiotics were very successfully used for many years. However, their efficiency was subsequently lost due to anti-microbial resistance.

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This discovery about antibiotics was very important achievement of 20th century⁴. Proper and judicial use of antibiotics reduces morbidity and mortality while inappropriate use promotes growth of resistant strains and reduces efficacy of drugs⁵. Edwards *et al.*, (2002) were of the firm opinion that the children were on the top of the list of maximum uses of antibiotics⁶. Most common and important cause of antibiotics resistance in children was upper respiratory tract infections (URTIs)⁷.

A number of problems were faced as a result of misuse or overuse of antibiotics, for example increase in antibacterial resistance, enhancement of burden of chronic disease, high cost of health services and increase of side effects like gastrointestinal effects⁸. The factors associated with unethical overuse of antibiotics has been studied and found independent of any variable like geographic area, payment resources, physician specialty and patients demographic. One of the very important examples of antibiotic resistance due to misuse is penicillin resistant pneumococcal infections. Studies has revealed that high rate of prescribing antimicrobial drug in children enhances risk of colonization and invasive diseases⁹.

Kozyrskyj *et al.*, (2004) revealed a very important fact associated with irrational use of antibiotics that is low education level among parents¹⁰. In addition to drug resistance other problems like drug allergies and other current infections and gastrointestinal effects can be decreased by improving awareness in parents and patients¹¹. Elbur Al (2016) revealed the public knowledge and practices about the antibiotics used in URTIs. They emphasized for the parents that there was a lot of difference between viral and bacterial infections with reference to mechanism and treatment at every level of care. Parents had no concept about the adverse drug effects and the drug resistance regarding antibiotics. The result of this practice was harmful and serious that can cause the drug resistance and inhibit the symptoms of current diseases which cause the child death¹².

The old people and the persons who are less educated have more interest and tendency towards using antibiotics¹³. Arnold *et al.*, (2005) also discouraged the self use of antibiotics in viral URTIs by parents as it has been found a major

factor in development of bacterial resistance in community¹⁴.

The position of Pakistan is just similar to other developing countries, people can purchase antibiotics from the open market without any prescription of a doctor. This is the reason that has increased the unreasonable use of antibiotics by public at large. A survey was carried out in Lahore Pakistan with regard to knowledge, attitude and practices (KAP) regarding antibiotic use among parents, to evaluate the different factors and reasons which are associated with the use of antibiotics among parents for their children. This survey will serve as baseline data and provide further insight planning and developing strategies for local health education purposes.

METHODOLOGY: A community based observational study design was adapted, using convenience sampling in different areas of Lahore, Pakistan during the period from June - 2017 to November - 2017 by using a self-administrated questionnaire. Those mothers or fathers were included which have the children under 5years of age. Parents who were doctor or from any other medical profession were excluded from the study to prevent potential bias. The questionnaire was adapted from previous study⁸ and slightly changed according to local population.

The questionnaire was designed in English version and it contained four parts. Part-I consisted of demographic characteristics of the respondents. Part-II contained 14 statements of knowledge about antibiotics use. Three options were given as "Yes", "No" or "Not Sure", and respondents were asked to choose from among these three options. Part-III contained statements which showed the attitude towards antibiotics. A likert scale was used to analyze the responses of the participants. The range from "strongly agree" to "strongly disagree" and simplified for assessing those who responded as "strongly agree" and "agree" as having "agreed" and those who answered "strongly disagree" and "disagree" and having "disagreed". Appropriateness of antibiotic usage indicated the positive attitudes/responses. Part-IV was designed as antibiotic usage to assess the recent use of antibiotics for the past one month among the respondents.

Face and content validity of questionnaire were determined by a panel of senior experts in the relevant field. Cronbach's alpha was used to assess the reliability of the questionnaire. The reliability analysis for knowledge about antibiotics use was 0.78 while for attitude about antibiotics use was 0.71. Before actual survey was started, the pilot study was conducted and found that respondents had easily understood and could answer the questions provided in the questionnaire. All the data was entered in statistical package for the social sciences (SPSS) version 20. Normality of data was checked by applying Skewness and Kurtosis. Descriptive statistics were used to summarize the data while 2-way ANOVA was run to check associations of demographic variables with knowledge, attitude and practices of antibiotics use. $P \leq 0.05$ was taken as significant.

Ethics Considerations: Study was approved from Lahore College for Women University Lahore Pakistan. Written informed consent was taken from the participants. Confidentiality of the participant's information was assured and maintained.

RESULTS: A total of 480 participants were approached out of which some participants refused to participate in the study while some returned incomplete forms which were not included in the analyses. So, total 400 participants filled the questionnaire and the responses rate was 83%.

Demographics Characteristics of the Respondents: Demographic characteristics of the respondents are depicted in **Table 1**. The mean age of participants was 32 years in which the age of males was 34 years while mean age of females was 30 years old. There were 44% participants who belonged to nuclear families and 56% belonged to joint family system. 308% participants had 1 - 2 children while the 52% participants had 3 - 4 children and only 10% participants had 5 -7 children. Almost 46% were tertiary educated, 36% were secondary educated, 12% were primary educated and 6% were illiterate while for the education of spouses of the participants indicated that 7% were illiterate, 9% were primary educated, 40% were secondary educated and 44% were tertiary educated. 53% preferred private clinic to seek check up while 29% consulted government hospital and 18% preferred NGO clinic/dispensary for checkup.

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Variables	Total (N=400)	Males (n=150)	Females (n=250)
	M(SD)	M(SD)	M(SD)
Age (in years)	32(6.59)	34(6.6)	30 (6.1)
20-30 years	201(50.3)	45(30)	156(62.4)
31-40 years	164(41)	85(56.7)	79(31.6)
41-50 years	35(7.8)	18(12)	17(5.2)
Number of Children			
1-2	151(38)		
3-4	205(52)		
5-7	40(10)		
Education			
Illiterate	24(6)	7 (5)	17(7)
Primary	48(12)	22(15)	26(10)
Secondary	143(36)	41(27)	102(40)
Tertiary	185(46)	80(53)	105(43)
Education of Spouse			
Illiterate	26(7)	8(5)	18(7)
Primary	37(9)	17(11)	20(8)
Secondary	161(40)	56(37)	105(42)
Tertiary	176(44)	69(47)	107(43)
Preference to seek checkup			
Private Clinic	213(53)	92(61)	121(48)
Government Hospital	115(29)	36(24)	79(32)
NGO Clinic/Dispensary	72(18)	22(15)	50(20)

Note: M=mean, SD=standard deviation, f=frequency

Level of Respondent's Knowledge about Antibiotic Use: Level of respondent's knowledge about antibiotic use is depicted in **Table 2**. Results showed that 92(23%) had poor knowledge about antibiotics while 252(63%) had moderate knowledge and only 44(11%) people had good knowledge.

TABLE 2: LEVEL OF RESPONDENT'S KNOWLEDGE ABOUT ANTIBIOTIC USE

Level of knowledge	Total score	f (%)
Poor	0-4	92(23)
Moderate	5-9	252(63)
Good	10-14	44(11)

Association of Demographic Characteristics with Knowledge: Association of demographic characteristics with knowledge is described in **Table 3**. A total of 296 (74%) of the respondents were of the firm opinion that the antibiotics were useful for the treatment of bacterial infections and a significant association was found with the number of children ($p=0.000$), education ($p=0.001$) and spouse education ($p=0.000$). On the other hand about 193 (48.3%) respondents were of the opinion that viral infections can be treated with antibiotics,

with a significant association was found with the number of children ($p=0.001$), education ($p=0.01$) and spouse education ($p=0.005$). 162 (40.5%) were of the opinion that infections can be cured by antibiotics and a significant association was found with the education ($p=0.05$) and spouse education ($p=0.031$). A total of 173 (43.3%) respondents were of the opinion that antibiotics are indicated to relieve pain/ inflammation while 188 (47.0%) said that antibiotics are used to stop fever.

189 (47.3%) had knowledge that Penicillin is an antibiotic with a significant association with education ($p=0.003$) and spouse education ($p=0.002$). 94 (23.5%) knew that the new generation of antibiotic is aspirin showing significant association with the number of children ($p=0.017$), education ($p=0.001$) and spouse education ($p=0.001$). When respondents were asked Is paracetamol is an antibiotic? 76 (19%) replied yes while 217 (54.3%) said no showing significant

association with the education ($p=0.000$) and spouse education ($p=0.001$). 200 (50%) knew that the main cause of antibiotic resistance was misuse of antibiotics showing significant association with the number of children ($p=0.01$), education ($p=0.003$) and spouse education ($p=0.002$). 197 (49.3%) said antibiotics may cause allergic reaction. Only 140 (35%) knew that all antibiotics do not cause side effects showing significant association with the spouse education ($p=0.029$).

A total of 169 (42.3%) knew that if the symptoms are improving then you may stop taking full course of antibiotics showing significant association with the education ($p=0.000$) and spouse education ($p=0.000$). On the other hand, 219 (54.8%) knew that if the full course of antibiotics is not completed then the effect of treatment is reduced showing significant association with the number of children ($p=0.008$), education ($p=0.000$) and spouse education ($p=0.000$).

TABLE 3: ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS WITH KNOWLEDGE

S. no.	Statements				P Value				
		Yes f(%)	No f(%)	Not sure f(%)	Age	Gender	No. of Child	Edu	Spouse Edu
Role of antibiotic									
1	Medicines that can kill bacteria is known as antibiotics	296 (74)	46 (11.5)	58 (14.5)	0.671	0.158	0.000	0.001	0.000
2	Viral infections can be treated with antibiotics	193 (48.3)	136 (34)	74 (17.8)	0.108	0.587	0.001	0.010	0.005
3	Infections can be cured by antibiotics	162 (40.5)	154 (38.5)	83 (20.8)	0.975	0.052	0.266	0.050	0.031
4	Antibiotics are indicated to relieve pain/ inflammation	173 (43.3)	157 (39.3)	70 (17.5)	0.092	0.509	0.218	0.153	0.096
5	Antibiotics are used to stop fever	188 (47.0)	137 (34.3)	74 (18.5)	0.192	0.743	0.145	0.298	0.201
Identification of antibiotic									
6	Penicillin is an antibiotic	189 (47.3)	95 (23.8)	116 (29)	0.136	0.140	0.318	0.003	0.002
7	The new generation of antibiotic is aspirin	94 (23.5)	205 (51.3)	99 (24.8)	0.257	0.661	0.017	0.001	0.001
8	Is paracetamol is an antibiotic?	76 (19.0)	217 (54.3)	106 (26.5)	0.396	0.458	0.710	0.000	0.001
9	Diphenhydramine is not an antibiotic	98 (24.5)	128 (32)	176 (43.3)	0.201	0.249	0.154	0.468	0.263
Dangerous of antibiotic									
10	The main cause of antibiotic resistance is misuse of antibiotics	200 (50.0)	90 (22.5)	110 (27.5)	0.375	0.535	0.0108	0.003	0.002
11	Antibiotics may cause allergic reaction	197 (49.3)	104 (26)	96 (24)	0.892	0.114	0.066	0.425	0.265
12	All antibiotics do not cause side effects	140 (35.0)	164 (41)	93 (23.3)	0.030	0.594	0.055	0.145	0.029
Accomplishment of treatment									
13	If the symptoms are improving then you may stop taking full course of antibiotics	169 (42.3)	171 (42.8)	59 (14.8)	0.158	0.493	0.063	0.000	0.000
14	If the full course of antibiotics is not completed then the effect of treatment is reduced	219 (54.8)	94 (23.5)	85 (21.3)	0.252	0.534	0.008	0.000	0.000

Note: Percentages are based on observed values, missing values are excluded

Association of Demographic Characteristics with Attitude: Association of demographic characteristics with the attitude is depicted in **Table 4**. Results showed that 123(30.8%) of the respondents agreed and 194(48.5%) disagreed that they will give antibiotics to their child in case of cold in order to get him recovered quickly, showing

a significant association with the number of children ($p=0.001$), education ($p=0.000$) and spouse education ($p=0.000$). On the other hand 118 (29.5%) agreed and 183(45.8%) disagreed that they would expect from their doctor to prescribe antibiotics for them showing a significant association with age ($p= 0.013$), education

(p=0.004) and spouse education (p=0.000). 135 (33.8%) agreed and 155(38.8%) disagreed that when their child starts feeling better than they discontinue giving him antibiotics showing a significant association with the number of children (p=0.017). 217(54.3%) of the respondents agreed and 92(23.1%) disagreed that they read the date of its expiry before giving antibiotics to child showing a significant association with the number of children (p=0.022), education (p=0.012) and spouse education (p=0.044).

111(27.8%) of the respondents agreed and 209(52.3%) disagreed that they generally keep a stock of antibiotics at home to use the same at the

time of emergency, showing a significant association with the education (p=0.000) and spouse education (p=0.000). 118(29.5%) of the respondents agreed and 171(42.8%) disagreed that they will use the remaining antibiotics for a respiratory disorder showing a significant association with the number of children (p=0.023), education (p=0.000) and spouse education (p=0.000). 232(58.1%) of the respondents agreed and 86(21%) disagreed that they will use antibiotics according to the instructions printed on the label, showing a significant association with the education (p=0.028) and spouse education (p=0.006).

TABLE 4: ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS WITH ATTITUDE

S. no.	Statements	Agree f (%)	Disagree f (%)	Not sure f (%)	P Value (Chi square Test)				
					Age	Gender	No. of Child	Education	Spouse Edu
1	I shall give antibiotics to my child in case of cold in order to get him recovered quickly	123(30.8)	194(48.5)	83(20.8)	0.15	0.283	0.001	0.000	0.000
2	If my child suffers from common cold then i would expect from my doctor to prescribe antibiotics for him.	118 (29.5)	183(45.8)	99(24.8)	0.013	0.614	0.095	0.004	0.000
3	When my child starts feeling better than i discontinue giving him antibiotics	135(33.8)	155(38.8)	106(27.3)	0.814	0.123	0.017	0.082	0.477
4	Before i give antibiotics to my child's read the date of its expiry	217(54.3)	92(23.1)	90(22.5)	1.000	0.608	0.022	0.012	0.044
5	I generally keep a stock of antibiotics at home to use the same at the time of emergency	111(27.8)	209(52.3)	80(20)	0.257	0.201	0.257	0.000	0.000
6	I shall use the remaining antibiotics for a respiratory disorder	118(29.5)	171(42.8)	111(27.8)	0.023	0.007	0.023	0.000	0.000
7	I shall use antibiotics according to the instructions printed on the label	232(58.1)	86(21)	81(20.3)	0.483	0.593	0.810	0.028	0.006

Note: Percentages are based on observed values, missing values are excluded

Association of Demographic Characteristics with Practices: Association of demographic characteristics with the practices is depicted in **Table 5**. Results showed that 197(49%) of the respondents recently used antibiotics (within one month) showing a significant association with the spouse education (p=0.046). On the other hand 274 (68.5%) gave antibiotic themselves while 125(31.3%) by their spouse showing a significant association with gender (p= 0.000) and education (p=0.014). 299(74.8%) of the respondents used prescribed antibiotics, 59(14.8%) used without prescription and 38 (9.5%) from retail pharmacy, showing a significant association with the number of children (p=0.016), education (p=0.000) and spouse education (p=0.000). Among reasons of taking antibiotics, 112 (28%) were due to fever, 55 (13.8%) due to pain/Inflammation, 63 (15.8%)

UTIs, 40 (10%) skin problems, 81 (20.3%) respiratory illness and 49 (12.3%) others.

Knowledge Regarding Antibiotics Use With-In Gender and Educational Level: Knowledge regarding antibiotic use with-in gender and educational level is depicted in **Table 6**. However; effect of education level was significant (p<.001). A series of post-hoc analyses were performed to examine individual mean difference comparisons across all four levels of education and dependent variable. The results revealed that post-hoc mean comparisons were statistically significant for knowledge about antibiotics (p < .001). That is, on average, illiterate (M=2.33, SD= .59) had poor knowledge about anti-biotic use than people with primary (M=5.22, SD= .39), secondary (M=6.48, SD= 2.44) and tertiary education (M=7.1, SD= .20).

The difference in level of knowledge of antibiotics significantly varied across all education level. However; this difference was not significant between people having secondary and tertiary education.

TABLE 5: ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS WITH PRACTICES

S. no.	Statements	Responses	F (%)	P Value				
				Age	Gender	No. of Children	Education	Spouse education
1	Recent Use (within one month)	Yes	197 (49)	0.469	0.990	0.184	0.087	0.046
		No	202 (51)					
2	Given by	Self	274 (68.5)	0.244	0.000	0.550	0.014	0.222
		By spouse	125 (31.3)					
3	Sources of antibiotics	Prescribed	299 (74.8)	0.238	0.314	0.016	0.000	0.000
		Without prescription	59 (14.8)					
4	Reasons of taking antibiotics	Retail pharmacy	38 (9.5)	0.763	0.171	0.119	0.095	0.502
		Fever	112 (28)					
		Pain/Inflammation	55 (13.8)					
		Urinary Tract Infection	63 (15.8)					
		Skin problems/Wounds	40 (10)					
	Respiratory illness	81 (20.3)						
	Others	49 (12.3)						

TABLE 6: KNOWLEDGE REGARDING ANTIBIOTIC USE WITH-IN GENDER AND EDUCATIONAL LEVEL

Sources	Mean(M)	Standard deviation(SD)	ANOVA(F)	P
Gender			.82	.36
Educational Level			23.99	<.001*
Illiterate	2.33	.59		
Primary	5.22	.39		
Secondary	6.48	.24		
Tertiary	7.11	.20		
Gender* Educational Level			.32	.81

Knowledge Regarding Antibiotic use with-in Gender and Educational Level: Knowledge regarding antibiotic use with-in gender and educational level is depicted in **Table 7** However; effect of education level was significant. Association between gender and education level was insignificant for attitude towards antibiotics. A series of post-hoc analyses were performed to examine individual mean difference comparisons across all four levels of education and attitude towards antibiotic's usage. The results revealed that

post-hoc mean comparisons were statistically significant for attitude towards antibiotics ($p = 0.005$). That is, on average, the attitude between illiterate ($M=13.42$, $SD= .59$) and tertiary educated people ($M=12.08$, $SD= .19$) significantly differed while attitude style of illiterate and those having primary and secondary education did not differ significantly. Next, attitude towards antibiotics significantly differed between people having secondary ($M = 13.00$, $SD = .24$) and tertiary education. The latter group had positive attitude.

TABLE 7: ATTITUDE REGARDING ANTIBIOTIC USE WITH-IN GENDER AND EDUCATIONAL LEVEL

Sources	Mean(M)	Stand Dev (SD)	ANOVA (F)	P
Gender			.34	.56
Educational level			4.40	.005*
Illiterate	13.42	.59		
Primary	13.03	.38		
Secondary	13.00	.24		
Tertiary	12.08	.19		
Gender* Educational level			.85	.47

DISCUSSION: Parent's knowledge and attitudes towards antibiotics play a vital role in the success of treatment process. The purpose of this study is to analyze the parent's knowledge and attitudes towards antibiotic usage. A survey conducted from the general community on random basis keeping in view the age of children which was less than five

years. A total of 83% respondents were of the view that antibiotics show better result in viral diseases and this finding was in accordance with the studies carried out in Europe, Wisconsin and Minnesota (54 - 55%)^{15, 16}. However, in a survey conducted in Malaysia and New Jersey much lesser proportion than this was reported which was 67.2% and 70%¹⁷

respectively. The reason of this proportion in these countries was perhaps due to the inadequate knowledge of the parents who related to less developed countries. There were a large number of parents who were so much un-educated that they could not differentiate between germ and microbiological terms bacteria and viruses.

They assumed that germ and bacteria is the same thing. Similarly, they were also not conversant about the difference between “antibiotics” and the word “medicine”. Because of lesser information hardly less than a half respondents had given correct answer and also had no consciousness of completing the full course of antibiotics when the symptoms of infection were growing higher. On the other hand the respondents who had correct knowledge in the previous studies conducted in Hong Kong was 58%¹⁸ and in Taiwan it was 50%¹⁹. As a result of this discussion it is easy to say that the use of antibiotics in parents who had sufficient knowledge thereof was more than those parents who were illiterate or had little knowledge about antibiotics. It means that the level of education of the parents is essential to have the information about the usage of antibiotics.

This finding was just in accordance with the survey study of Kotwani *et al.* According to his findings 67% parents were those who used antibiotics for their children and they belonged to the category of parents whose children were found infected from an infection. From this discussion it can be derived that some viral or bacterial infection was found spread in the atmosphere and for this reason the antibiotics were amply used for the treatment of children²⁰. Previous and present survey studies showed that the parents feel much satisfaction in the advice of the pediatricians. The pediatricians were of the view that the parents were inclined to use antibiotics for their children for the treatment of URTIs²¹. The parents in thickly populated communities have little knowledge of medicines although they think that they have ample knowledge about drugs and medicines. Perhaps this is the reason that the parents frequently use antibiotics, and this fact was also confirmed by the present study⁶. Majority of the respondents use antibiotics after consulting their doctors about the usage of the antibiotics and without any prescription in this respect.

In the present study the ratio of such parents was found more than 14.8% as compared to those parents who were in Europe and their ratio was 76%²². Nevertheless, there is a need of further investigation in Lahore about the need and importance of over the counter (OTC) sales of antibiotics without the prescription of doctors.

In the present study, 28% of the participants took antibiotics for a fever, which was the lowest percentage as in a British community who thought antibiotics could relieve cough and cold symptoms²³ whereas 20% parents had taken such antibiotics to cure the respiratory illness. It was also noticed in the present study as well as in previous studies that URTIs were the most common infectious diseases in children. These diseases commonly included cold, influenza, rhinorrhea and bronchitis. As per survey study generally a child suffers three to eight times per year from common cold and sometimes twelve episodes of common cold every year²⁴.

The factors related to patients includes misuse of antibiotics, and the increase of antibiotics resistance also depends on the behavior of the patient such as intake of improper dosage of drugs, it also happens that sometimes the patients do not take proper dosage of drugs or they stop taking medicine before the time period prescribe to them²⁰. Young parents were most likely to believe in effectiveness of antibiotics treatment against viruses than elder parents⁴.

The main reason of high consumption of new brands and expensive antibiotics was the doctor's personal interest. The doctors serving in private sectors were inclined to prescribe those brands of antibiotics in which they could earn more profit. It was also observed that such doctors also prescribed costly antibiotics to the patients when they were not interested in the increase of their profit²⁰. The effectiveness of antibiotics is strongly associated with higher education and better knowledge. As the present study showed that there is no significant difference between knowledge and attitude as far as the use of antibiotics is concerned. The study showed that the individuals who possess better knowledge and attitude about antibiotics generally use the antibiotics freely as self-medication. More the knowledge about antibiotic usage more positive is the attitude towards its usage and *vice versa*²³.

The result of present study was same as in previous studies; showed that the parents who belong to sound social and financial sector and also have higher education, can afford to go to the health care providers for consultation and proper treatment but they believe in the usage of antibiotics more than those who belong to poor and un-educated class. They do so despite the fact that they very well know and better understand the disadvantages of misuse of antibiotics which lead to harmful effects and casual bacterial resistance. There is a need that the health care providers and different health care NGOs should enhance the knowledge of the parents by using different techniques and prohibit them from the inappropriate use of antibiotics which they use because of their misunderstanding and wrong expectations of immediate relief by the antibiotics²⁵.

CONCLUSION: The survey revealed that there is a diversity of public awareness about antibiotics and microbiological resistance on the basis of socio-demographic factors. The misuse of antibiotics is an important issue in public health which affects the society and individual people. It was found that inappropriate use of antibiotics in Lahore Pakistan is still prevalent inspite of the fact that many campaigns were done to educate people and positive results had come out of such campaigns. It was found that the awareness of the public about the antibiotics and their microbiological resistance varied amongst the public on the basis of socio-demographic factors. The main issue is the misuse of antibiotics in Public health which badly affects the individuals and public at large. The use of antibiotics for the treatment of URTIs was immaterial.

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COMPETING INTERESTS: The authors declare that they have no competing interests.

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