

# Knowledge, Attitude and Practice of Antibiotics Usage among patients attending OPD of a Dental College Hospital in Dhaka, Bangladesh

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## Abstract:

**Background:** Antibiotics Resistance has been in the limelight of medical developments for long. The patient factor, mainly social aspect of it is overshadowed by ever growing new potent drugs and medical technologies. Bangladesh is no exception to the rest of the world. However, relatively fewer works have been published on the relationship between Knowledge, Attitude and Practice (KAP) and Antibiotics Resistance within Bangladesh. This study was done to assess the present status of knowledge, attitude and practice on the use of antibiotics among the people visiting a tertiary care dental hospital in Dhaka; Bangladesh. This will further assess the current status of knowledge on antibiotics and its resistance, attitude towards its use and practices pertaining to it among Bangladeshi general public. It is also aimed at evaluating the behavioral pattern towards use of antibiotics among these group within wide range of income groups and different educational backgrounds.

**Materials & Methods:** A cross-sectional observational study was conducted among patients attending OPD of Dhaka Dental College & Hospital. Patients from all the social background participated in this study. Sample sizes of 562 patients were surveyed. Structured self-administered assessment questionnaire was used to collect the data. SPSS version 24 software was used for data analysis.

**Results:** Of 562 respondents; 64% were female while male constituted 36%. Majority of them fell in the age group of 18-47 consisting of 84.4%. 62.4% of the respondents were married and majority 94% belonged to Muslim faith. 93.2% of the respondents had at least primary level educational status. 52% of the respondents belonged to the low income group while 48% constituted high income group. 86.1% of the total respondents knew that indiscriminate use of antibiotics leads to certain harm to the body, while the majority, almost 97.5% have never heard of the term antibiotics resistance. There appears to be statistically significant relationship between the level of education and higher income group with that of KAP on antibiotics usage.

**Conclusions:** The study population had variable understandings on antibiotics and its resistance. This study provides the need to educate people to make them change their mindset towards antibiotics. Most of the people don't take antibiotics after their infections are subsided or after they become alright. A better and revised strategy of awareness campaign might be needed among the public to educate them on it.

**Key words:** Knowledge, Attitude, Practice, Antibiotics, Dental College Hospital.

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## Introduction:

Sir Alexander Fleming, a Scottish Scientist discovered the antibiotics from fungal species in 1928. Before this magnificent discovery 88 years ago, something as simple as a finger prick could get someone killed. We are lucky today that such an incident can be avoided. Antibiotics are one of the most successful stories in the history of medical science that continue to save lives and combat infections. The advent of antibiotics in clinical practice during the 1940's created a revolution in the treatment of infectious diseases.<sup>1</sup>

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However, as a consequence of the use and misuse of antibiotics, the microbes started to evolve resistance to different classes of antibiotics through different mechanisms, which threaten the human and animal health globally. On 11 December 1945, immediately after winning the Nobel Prize, he warned about possibility of emergence of resistance as a consequence of misuse of the miracle drug, Penicillin. "The thoughtless person playing with penicillin treatment is morally responsible for the death of the man who succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted." (Fleming, 1945). In recent decades, the emergence and spread of bacterial resistance to antibiotics is a growing problem worldwide, which presents a significant threat to public health globally in the 21st century.<sup>1</sup>

Antibiotics are the most commonly prescribed drugs in clinical practice. Very often though, Antibiotics use is either unnecessary or inappropriate. This indiscriminate use of

antibiotic has significantly contributed to the problem of antibiotic resistance. In recent decades, the emergence and spread of bacterial resistance to antibiotics is a growing problem worldwide, which presents a significant threat to public health globally in the 21st century.<sup>1</sup>

The threat of antibiotics resistance is rapidly progressing and intensifying. Various approaches have been taken worldwide, to meet the challenges which are posed by its spread. One of the approaches which is commonly suggested is to undertake instructional and educational campaigns among the general population<sup>2</sup> as well as among the health care personnel<sup>3,4,5</sup> about antibiotic resistance.

Various studies have described the inadequate knowledge among the consumer population and inability of the prescribing physicians to creating awareness and providing adequate education to the patients regarding antibiotic usage. The interventions which are undertaken to prevent and control antibiotics resistance, usually aim to bring about behavioral changes in the target group, and the outcome of these interventions is affected by the previous beliefs and motivations which are held by the group. Hence, for any educational intervention to be successful and for the changes to be sustained, it should change the knowledge, attitudes and practices of the target group. This study was undertaken among the patients attending Dhaka Dental College & Hospital from December 2016 – April 2017.

**Materials & Methods:**

A quantitative, cross-sectional observational study was performed using a pretested self-administered questionnaire on a sample of 562 patients attending the OPD of Dhaka Dental College Hospital. The study population comprised of patients aged 15-80 years. This study was done in February 2017. Structured Self-administered Assessment Questionnaires were used to collect the data. SPSS software version 24 was used for data analysis.

Descriptive statistics were used to find the frequencies and percentages. The answers on the knowledge were coded “1 to 5” with 1 being excellent, 2=very good, 3=good, 4=satisfactory, 5=poor. All the answers were summed and specific and overall knowledge was calculated. Cross-tabulation and Chi-square tests were done to find association between knowledge and sociodemographic variables, risk-resistance behavior and socio-demographic variables, and knowledge and risk behavior.

**Results:**

*Socio-demographic variables*

A total of 562 individuals attending Dhaka Dental College Hospital within the age group of 15-80 have been surveyed. Following independent variables were included for the study: (1) gender: males and females; (2) age: [18–32 years], [33–47 years], [48–62 years], [63+ years]; (3) marital status:

married and married; (4) level of education: [No formal Education], [Pry. School Education], [HSC Education], [Undergraduate Education], [Post Graduate degree holders]. (5) Monthly income: low [< 20,000 Bangladeshi taka], High [>20,000taka]. Table No. I summarizes the complete socio-demographic profile of the study population.

**Table I**  
*Socio-demographic variables of the study population*

Characteristics	Number (n=562)	Percentage (%)
<b>Sex</b>		
Male	202	36.0%
Female	360	64.0%
<b>Age group</b>		
18-32	303	54.0%
33-47	171	30.4%
48-62	83	14.8%
63+	5	0.5%
<b>Marital Status</b>		
Married	351	62.4%
Unmarried	211	37.6%
<b>Religion</b>		
Islam	528	94.0%
Hinduism	18	3.2%
Christianity	14	2.4%
Others	2	0.4%
<b>Educational Status</b>		
Graduate Degree	133	23.6%
Undergraduate Degree	63	11.2%
HSC Education	225	40.0%
Pry. Education	103	18.4%
No Formal Education	38	6.8%
<b>Income/Month</b>		
Low Income Group(<20,000 taka)	292	52%
High Income Group (>20,000 taka)	270	48%

Of 562 patients, 36% were male respondents while 64% of the respondents were female. These patients had the mean age of 33.6 years with lower percentile of 24 and upper percentile as 40. The Standard Deviation marked for the age

among the surveyed patient stood to be 11.2. The majority (94%) of the study population belonged to Islamic faith while only about 3.2% belonged to Hinduism and 2.4% belonging to Christianity. There was a recorded 0.4% other faith respondents. The major 62.4% of the respondents were married. Forty percent of the respondents had HSC qualification; 23.6% had graduate degrees certificate, 18.4% with Primary School Education, 11.2% with undergraduate degrees while the 6.8% of respondents had no formal education.

High income group with those earning more than 20,000 taka per month composed about 48% of the study population while 52% composed of low income group with earnings less than 20,000 taka per month.

### **Knowledge on Antibiotics**

The study assessed five aspects of knowledge on Antibiotics among the study population, 1. General Knowledge on Antibiotics, 2. Knowledge on the purpose of antibiotics being prescribed to them, 3. Instructions that was given by doctor when being prescribed, 4. Knowledge on effects of incomplete dosage of antibiotics 5. Knowledge on the topic of Antibiotics Resistance.

To assess the knowledge on antibiotics they were made to assess their own knowledge with subjective response on antibiotics usage with the visual scale ratings of excellent, very good, good, satisfactory and poor. Similarly, if they knew the purpose of antibiotics they were prescribed, they were given the option to tick YES for positive and NO for the negative answer. They were also assessed on whether doctors gave them set of instructions while taking antibiotics and was given the question with responses of YES and NO. For YES, they were made to specify the instructions.

Further, they were asked if the incomplete dosage of antibiotics was harmful for the body with expected responses of YES and NO. In order to assess the level of knowledge on antibiotics resistance, they were asked if they had any idea on Antibiotics Resistance with response options of YES and NO. Those choosing yes were given a space to provide what they knew of it. The average score of general knowledge recorded was 52.6%. 18.8% of the respondents had excellent knowledge on antibiotics 23.2% marked Very Good, 24.8% Good, 16.8% Satisfactory and 16.4% No Knowledge. [Table-II]

The majority of the people knew the purpose of antibiotics given to them with 84.4% responding YES to the question. The respondents were furthered queried upon if they were given set of instructions by the doctors before getting it

prescribed. Here, 88.8% of the respondents responded positively in getting the full instructions.

When they were assessed with objective query and asked if they think incomplete dosage of antibiotics would harm their body and if so in what ways, 86% of the respondents responded with knowledgeable YES and 38.4% of the respondents mentioned that infection may develop due to incomplete usage while 20.8% stated that it may not work properly next time. 18.8 % responded with having no ideas while another 22% mentioned actually on the resistance of the microbes.

Table-II describes the complete list of survey questions used for assessing the knowledge, attitude and practice of study population along with the percentage of respondents

### **Knowledge vs. Socio-demographic variables**

This study revealed a statistically significant ( $P < 0.01$ ) association between levels of Education and level of knowledge on Antibiotics Resistance. Respondents with higher educational level had more knowledge on Antibiotics Resistance. There observed a linear correlation between the level of knowledge and the educational level as it increased from primary to graduate level. A significant correlation is also found between the Knowledge on Antibiotics and the Age group with Pearson Chi square value of  $P < 0.01$ . Age group of 18-32 has highest level of knowledge on antibiotics resistance.

The study showed higher female respondents and consequently had better knowledge among female respondents compared to their male counterparts. In a multiple response sheet females exhibited highest number of response in [Good] followed by [Very Good] and [Excellent]. Concurrently for the male respondents, it the number of response was noted highest in [Excellent] first followed by [Very Good] and [Good].

This difference in variation is attributed to large female respondents with lower level of educational backgrounds compared to their male counterparts. Additionally, a better knowledge on antibiotics was observed among the unmarried respondents which comprised largely of younger generations aged below 30. The variables constituting different faiths were insignificant for this comparison as largely [97.8%] of the study population belonged to the faith of Islam. Table-III gives the descriptive cross tabulation result of different variables on which knowledge of respondents were assessed.

**Table-II**  
*Frequency and Percentage of respondents to the questionnaire*

Questions	N=562 Responses								
	Excellent	Very Good	Good	Satisfactory	Poor				
<b>Questions assessing Knowledge on Antibiotics</b>									
1. How well do you know about antibiotics?	Count	108	128	144	90	92			
	Percent	19.2%	22.8%	25.6%	16.0%	16.4%			
2. What was the purpose of Antibiotics given to you?	Count	206	35	169	56	42	11	10	33
	Percent	36.7%	6.2%	30.1%	10.0%	7.5%	2.0%	1.8%	14%
3. Have you heard anything about Antibiotics Resistance?	Count	14	548						
	Percent	2.5	97.5%						
		Antibiotics may not work properly next time	Infection may Rise	Don't Know					
4. What complication do you think may occur by incomplete dosage?	Count	116	217	39					
	Percent	20.6%	38.6%	6.9%					
<b>Questions assessing Attitude towards Antibiotics</b>									
1. Have you ever taken antibiotics before?	Count	557	5						
	Percent	99.1%	0.9%						
2. Did Doctor give you instructions when taking antibiotics?	Count	501	61						
	Percent	89.1%	10.9%						
	Complete the dose	Take medicine on time	Buy from trusted drugstore	All of above	Don't remember				
3. What were the instructions?	Count	76	152	78	199	2			
	Percent	13.5%	27%	13.9%	35.4%	0.4%			
4. Do you think it is important to follow Dr.'s Instruction?	Count	533	27	2					
	Percent	94.8%	4.8%	0.4%					
5. Do you think incomplete dosage can cause harm?	Count	484	78						
	Percent	86.1%	13.9%						
<b>Questions assessing Practice Behaviors.</b>									
1. How many times did you take antibiotics so far?	Count	38	39	46	72	367			
	Percent	6.8%	6.9%	8.2%	12.8%	65.3%			
2. What are the source of Antibiotics?	Count	373	39	150					
	Percent	66.4%	6.9%	26.7%					
		Licensed Medical Doctor	Ayurvedic Practitioner	Local Healer	Self-Medicated	Pharmacy/ Drugstore	Family/ Neighbors		
3. By whom was it prescribed?	Count	464	4	29	31	28	6		
	Percent	82.6%	0.7%	5.2%	5.5%	5.0%	1.1%		
4. Have you completed the dosage?	Count	217	257	88					
	Percent	38.6%	45.7%	15.7%					
		Too poor to buy medicine	Too busy to buy medicine	Left after I was alright	Stopped on family/ friends advice	Other Reasons			
5. Why didn't you complete the dosage?	Count	5	9	283	8	7			
	Percent	0.9%	1.6%	90.7%	1.4%	1.2%			

**Table III**  
*Correlation between Knowledge of Antibiotics and its dependent parameters*

Parameters	(n=562)	Knowledge on Antibiotics					P-Value
		Excellent	Very Good	Good	Satisfactory	Poor	
Age	(18-99)	108	128	144	90	92	0.0001
Sex	Male	54	50	37	26	32	0.001
	Female	54	78	107	64	60	
Marital Status	Married	59	59	103	70	60	0.0001
	Unmarried	49	69	41	20	32	
Education	No Formal Education	0	2	4	11	19	0.0001
	Pry. School	4	21	21	25	30	
	High School	13	28	94	48	43	
	Undergraduate	8	37	14	6	0	
	Postgraduate	83	40	11	0	0	

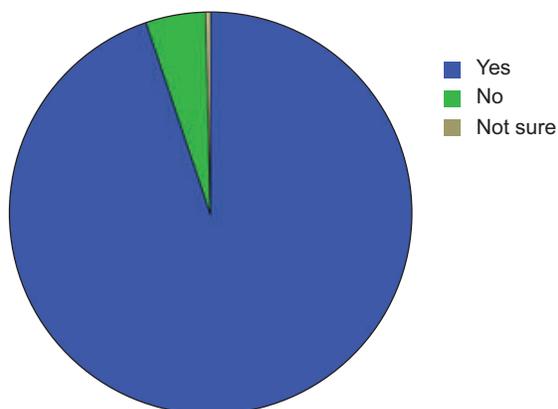
**Attitude towards Antibiotics**

In order to assess the attitude of respondents towards antibiotics, patient were asked of their thoughts if it is important that they thought doctors instruction were important, if they thought the incomplete dosage of antibiotics might rage any havoc in health. Both of these questions had similar responses with 94.8% responding the imperative need to follow doctor’s instructions. Likewise majority, 86.1% of the respondents thought incomplete dosage of antibiotics will cause harm to their body. [Figure.

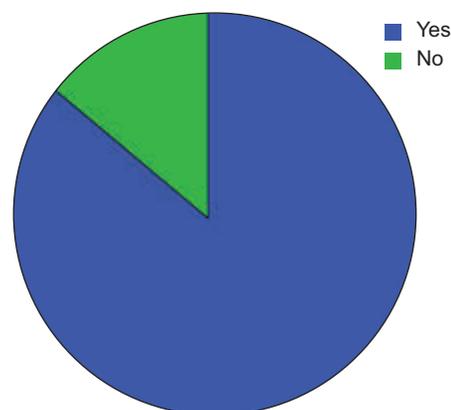
1] With this result, we can say that people generally have positive attitude towards antibiotics usage.

To test the correlation between the attitudes and the socio-demographic variable, a Pearson chi square test with cross table reference was analyzed. It has thus been found that while increase in age, difference in gender and faith did not have any significance to the attitude ( $P>0.05$ ); the educational status and socio-economic background had positive significance to the attitude with p value [ $P<0.05$ ].

Do you think it is important to follow Dr's Instruction ?



Do you think incomplete dosage can cause harm ?



**Figure 1:** Attitudinal responses towards antibiotics Usage.

### Practice of Antibiotics Usage among the Respondents

The respondents were asked how many times they have taken antibiotics so far in their life time to provide the idea if patients have been on high frequency exposure to antibiotics. Then they were asked if the antibiotics they had taken have been prescribed by a professional doctor or others. Then they were assessed on whether they completed the prescribed antibiotics on full scheduled dosage. Respondents who didn't complete the dosage were asked for the reasons. The study revealed that majority of the respondents 367 of 562 comprising 65.2% has been prescribed antibiotics for more than 5 times so far in their lifetime. Of that 66.4% have gotten it from licensed medical practitioners while 6.9% have gotten it from other non-prescribed sources. The rest, 26.7% have either gotten it from either of the two.

Less than half of the respondents, 257 out of 562 comprising of 45.7% of them have not completed the prescribed antibiotics dosage. 88 respondents comprising 15.7% have completed their dosage at one point of their prescription while 38.6 % have completed their scheduled dosage every time. Out of 257 respondents not completing the scheduled dosage, more than 80% of them stopped their scheduled dosage after they became well. This is a definitive indicator of poor practices of antibiotics usage among the respondents even though with high positive attitude towards it.

### Practice of antibiotics Usage Vs. Socio-demographic variables

This study revealed statistically significant correlation between the certain aspects of socio-demographic variables like educational status and income group [ $P < 0.05$ ] while to lesser extent age has been mildly significant. The gender, marital status and religion are of no significance to the practice behaviors [ $P > 0.05$ ]. This had several components to assess the Antibiotics Resistance risk behaviors. The respondents were asked on number of times they were given antibiotics and for what reason, if they completed the dosage and if not why. Of the total respondents, only less than half (45.7%) have completed the antibiotics dosage prescribed. 54.4% of the respondents at one point or other times of the antibiotics prescription have not completed their full dosage. Out of this group, more than 50% of them cited a common reason of leaving the rest of the dosage incomplete after getting alright with first few days of medications. This is a pertinent issue which will need behavioral change among the population in order to minimize the antibiotics resistance.

### Discussion:

The main purpose of this study was to assess knowledge attitude and practice of antibiotics usage among the patients

visiting an apex dental institute in Dhaka, Bangladesh. The overall knowledge on antibiotics is basic (61.6%) while the knowledge on antibiotics resistance is poor with 0.81%. The attitude towards antibiotics is excellent given that most of the respondents (93.2%) regarded incomplete dosage of antibiotics as begetting harmful effects. However the respondents had indicated poor behavior towards antibiotics usage with only less than half (45.6%) of respondents having completed the full dosage of given antibiotics.

A similar findings were reported from study done among publics in Kuwait where they found that even an economically more developed country like Kuwait had about 47% marked as low knowledge group on antibiotics usage and safety behavior while marking 41% labelled to use antibiotics inappropriately. This finding is in contrast to the study done among the college going MBBS students in Nagpur India which showed high level of awareness among the students with 100% knowledge on antibiotics resistance. In the same study they have shown that ninety-four per cent of the surveyed respondents were aware that bacteria were not responsible for causing colds and flu.

This finding clearly suggests that the knowledge level on judicious use of antibiotics and antibiotics resistance is high among the medical students and publics of better economic standing than those stated otherwise. This is supported by our study as study groups of those with lower economic background and low educational background had very significant correlation ( $P > 0.56$ ) with the knowledge and use of antibiotics.

In another study conducted among the paramedical staffs in Chennai India, the study showed good knowledge standing among the staffs but poor attitude and practices towards Antibiotics usage. These contradictory outlooks present challenges that must be overcome if we have to effectively tackle the escalating problem of antibiotic resistance. The study suggested educational activities on treatment, campaigns and change of policy implementations in order to prevent the development of antibiotics resistance.

This finding is consistent with a study done in University of Turin, Italy. The study population consisted of medical, dental and nursing students with sample size 1050. The study found that 20% of the respondents stating antibiotics are appropriate for viral infections and 15% of the students that they stop taking those drugs when symptoms decrease. It showed that females were more likely than males to take antibiotics only when prescribed. It further showed that students with a relative working in a health-related field, as well as those who took at least one course of antibiotics in the last year, had a lower probability of taking those drugs

only under prescription. This paper clearly indicated how professional healthcare students do not care to practice what they know. The study suggested in generating more awareness protocols among the students as they will turn out to be the behavioral model for citizens and patients. It advised on introducing a specific course and training on antibiotics in the core curriculum of the School of Medicine. Therefore, it is important to revisit the current medical curriculum too.

#### **Conclusion:**

The study population had variable understanding on Antibiotics and its Resistance. One in three persons practiced behaviors that are seen as risky in developing antibiotics resistance. Compliance to doctor's instructions were low even though the respondents understood the importance of clinical advises. There was no reduction of risky behaviors with increasing level of knowledge indicating that increasing level of knowledge does not necessarily reduce risk of antibiotics resistance development. We have observed that knowledge on antibiotics resistance is poor among the study population and found it necessary to educate people about these to make them change their risky behaviors. Most of the people don't take antibiotics after their infections are subsided. A better and revised strategy of awareness campaign might be needed among the public to educate them on it.

These findings will aid in the assessment of the adequacy of present public educational campaigns. Also, it will provide further insight in designing future multifaceted interventions to promote specific messages in rationalizing antibiotic use, and compensate for knowledge and attitude gaps as an effort towards preventing development of antibiotic resistance.

**Conflict of Interest:** None

#### **References:**

1. WHO (2007). A safer future: global public health security in the 21st century. The World Health Report 2007. Available: <http://www.who.int/whr/2007> Accessed 11 July 2014. Retrieved: 07/05/2017
2. WHO (2001). WHO Global Strategy for Containment of Antimicrobial Resistance. WHO/CDS/CSR/DRS/2001.2. Available: [http://www.who.int/csr/resources/publications/drugresist/en/EGlobal\\_Strat.pdf](http://www.who.int/csr/resources/publications/drugresist/en/EGlobal_Strat.pdf). Accessed 11 July 2014. Retrieved: 07/05/2017.
3. Mahajan M. Deshmukh S. et al. A Questionnaire based Survey on the Knowledge, Attitude and Practises about Antimicrobial Resistance and Usage among the Second year MBBS Students of a Teaching tertiary care Hospital in Central India. *International Journal or Pharmacological Research*. 2017;7(4).
4. Sadasivami K. Ramraj B. et al "Knowledge, Attitude and Practice of Paramedical Staff Towards Antibiotic Usage and its Resistance." *Biomedical and Pharmacological Journal* 2016;9(1):337-343.
5. Khan A. Banu G. Reshma K. 'Antibiotic Resistance and Usage—A Survey on the Knowledge, Attitude, Perceptions and Practices among the Medical Students of a Southern Indian Teaching Hospital' *Journal of Clinical and Diagnostic Research*. 2013;7(8).
6. Scaiola G, Gualano MR, Gili R, Masucci S, Bert F, Siliquini R. "Antibiotic Use: A Cross-Sectional Survey Assessing the Knowledge, Attitudes and Practices amongst Students of a School of Medicine in Italy" *PLoS ONE* 2015;10(4):e0122476. doi:10.1371/journal.pone.0122476.
7. Awad AI, Aboud EA. Knowledge, Attitude and Practice towards Antibiotic Use among the Public in Kuwait. *PLoS ONE* 2015;10(2):e0117910. doi:10.1371/journal.pone.0117910.
8. Sanchez, G. V., Roberts, R. M., Albert, A. P., Johnson, D. D., & Hicks, L. A. Effects of Knowledge, Attitudes, and Practices of Primary Care Providers on Antibiotic Selection, United States. *Emerging Infectious Diseases* 2014;20(12): 2041-2047. <https://dx.doi.org/10.3201s/eid2012.140331>.