Assessment of Knowledge and Attitude Toward Antibiotic Use and Resistance among 4th Year Students of Shaheed Monsur Ali Medical College

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Abstract

Background: The misuse and overuse of antibiotics can lead to antibiotic resistance. Thus, it is important to have adequate knowledge and attitude toward antibiotic use and resistance for all specially the medical students who are the future healthcare practitioners. The aim of this study was to assess the knowledge and attitude toward antibiotic use and resistance among 4th year students of Shaheed Monsur Ali medical college. **Material & Methods:** This cross-sectional study was conducted in Shaheed Monsur Ali medical college, Dhaka, Bangladesh from October 2022 to December 2022. A structured questionnaire was administered to 126 randomly selected undergraduate medical students. **Results:** In our study, the percentage of male and female was same. Majority of the participants (55.56%) always get a prescription before starting antibiotics. Most of the participants (60.32%) never stop taking the prescribed antibiotics after their symptoms improved. Majority of the participants (54.76%) sometimes completed the course of the prescribed antibiotic treatment. In our study, majority of the participants (54.76%) sometimes take the correct dose of their antibiotics at the right time for the full duration. In this study, majority of the participants (47.62%) never save the remaining antibiotics for next time they get sick. Majority of the participants (73.02%) sometimes give leftover medication to friends or family if they get sick. For cough or sore throat, majority of the participants (48.41%) sometimes prefer taking an antibiotic. Most of the participants (69.05%) never buy the same antibiotics if they are sick that helped them get better when they had the same symptoms before. Most of the participants (96.03%) always check the expiry date of the antibiotic before using it. Knowledge level of antibiotic in majority of the participants (47.62%) was very good. Knowledge level of antibiotic resistance in majority of the participants (54.76%) was very good. Attitude level of antibiotic usage in majority of the participants (34.13%) was average, followed by 32.54% had bad, 32.54% good attitude level. **Conclusion:** From the findings of the study, it can be concluded though the knowledge level of the medical students is adequate, they are not careful about the usage of antibiotics and often misuse it. The students tend to not follow the rules of the usage guideline of antibiotics which ultimately results in antibiotic resistance. They should be more conscious to follow the guidelines of antibiotic usage.

INTRODUCTION

Antibiotics have a great contribution on saving patients' lives along with significant advancements in therapeutics.[1] However, there is an increasing concern about the growth of bacterial strains that are resistant to antimicrobial drugs globally, which has resulted in an antibiotics crisis.[2] The physicians of tomorrow are medical students. Undergraduate medical students should get enough instruction in the proper prescribing, dispensing, and usage of antibiotics in order to encourage their prudent use.[3] It is important to stress the significance of these concerns at this pivotal moment since, once they are qualified, it will be challenging to modify their well ingrained beliefs and behaviors.[4] Antibiotic usage and abuse provide selection pressure, which causes bacterial populations to evolve resistance characteristics.[5] Antibiotics, which continue to be one of the most successful tools in the fight against disease, were not the issue; rather, the issue was how the medications were being used. Antibiotic overuse or inappropriate use can quickly lead to the establishment of resistant bacterial strains, as well as severe responses and a financial burden on the country's healthcare system.[6] The World Health Organization chose the phrase "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow" as the day's theme.[7] Numerous tactics have been suggested to reduce the use of antibiotics, including formulary replacement or restriction, education of healthcare professionals, feedback initiatives, the need for an infectious disease specialist's approval before a drug prescription, and a more responsible use of antimicrobial agents globally.[8,9] Antibiotic resistance has been wreaked devastation by the irrational use of antibiotics.[10] The threat of antimicrobial inadequacy has steadily grown because to the growth of antibiotic-resistant bacteria worldwide. Patients with these antibiotic-resistant infections are likely to require lengthy hospital stays and second- and third-line medications, which may be more harmful and less effective.[11] Antibiotic resistance is an issue that affects public health globally and increases morbidity, death, and financial cost.[12,13] Medical students will work as general practitioners in the community. By judiciously prescribing the medicines and encouraging patient knowledge, these future prescribers serve as frontline combatants against antimicrobial resistance.[14] There is enough data to prove that freshly licensed doctors and prescribers lack the necessary training to safely administer drugs.[15,16] One of the causes of such can be a lack of proper instruction during the medical degree program. To lessen the severity of the antimicrobial resistance problem, physicians and future prescribers must alter the way they administer antibiotics.[17] This may be made sure by giving medical students and future doctors the proper education and training in a structured setting.[18,19] Medical students should be encouraged to prescribe

antibiotics judiciously as future doctors in addition to being made aware of the present and rising health challenges.[20] In order to lower antibiotic resistance, it has been suggested that undergraduate medical students receive proper instruction on prescription antibiotics and resistance.[14] The current study was conducted to assess the knowledge and attitude toward antibiotic use and resistance among 4th year students of Shaheed Monsur Ali medical college.

Objectives

To assess the knowledge and attitude toward antibiotic use and resistance among 4th year students of Shaheed Monsur Ali medical college.

MATERIAL AND METHODS

This cross-sectional study was conducted in Shaheed Monsur Ali medical college, Dhaka, Bangladesh from October 2022 to December 2022. A structured questionnaire was administered to 126 randomly selected undergraduate medical students. The questionnaire comprised a total of 11 questions which was divided into further sections. The statements regarding questions on antibiotics section include 9 questions, statements on antibiotic resistance section include 10 questions and the statements on the usage of antibiotics section include 10 questions. Knowledge level was measured in poor, good and very Good. Attitude level was measured in excellent, bad, average and good. For the assessment of knowledge and practice level, all characters were given a mark of +1, all wrong answers were given a mark of -1, and all in the between values like do not know were given a

mark of zero. Then a combination of the achieved values was calculated based on knowledge and attitude level separately. For knowledge level, a mark of over 80% for any group and criteria were marked as excellent, 50 to 80% were marked as good and less than 50 were marked as poor. For attitude level, a mark of over 80% for any group and criteria were marked as good, 50 to 80% were marked as average and less than 50 were marked as bad. After collecting and cleaning the data, they were entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22.

RESULTS

In our study, the percentage of male and female was same [Figure 1]. [Table 1] demonstrates the distribution of participants about knowledge on antibiotics. In our study, 23.02% participants knows that antibiotics are safe drugs, hence can be commonly used medications, 74.60% knows that broad spectrum antibiotics are more preferred for the treatment of bacterial infection, 93.65% knows that antibiotics are not effective drugs for the treatment of fever, 2.38% knows that there is no difference between coamoxiclav (Amoclan) and Amoxicillin, 97.62% knows that antibiotics should only be used when prescribed, 77.78% knows that antibiotics are not supposed to kill all bacteria in the body, 96.83% knows that the body can usually fight mild infections on its own without antibiotics, 93.65% knows that susceptibility tests helps to determine the likelihood that a particular antibiotic will be effective in treatment of a certain bacterial infection, and

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2.38% knows that antibiotics treat infections from fungi, virus and bacteria. [Table 2] shows the distribution of participants about knowledge on antibiotic resistance. 92.06% knows that bacteria can become resistant to antibiotics, 52.38% knows that people can become resistant to antibiotics, 95.24% knows that the more antibiotics we use in society, the higher is the risk that resistance develops and spreads, 4.76% knows that non-compliance does not contribute to the development of antibiotics resistance, 89.68% knows that resistance can spread from animals to humans, 75.40% knows that resistance can spread from person to person, 0.79% knows that today, antibiotics resistance is not a big problem in the world, 98.41% knows that taking antibiotics correctly may reduce the risk of antibiotic resistance, 8.73% knows that antibiotics should be stopped immediately when the patient is clinically improved to reduce the risk of resistance, and 99.21% had knowledge about the role to play in decreasing the prevalence of antibiotic resistance. [Table 3] shows the distribution of participant's attitude toward the usage of antibiotics. In our study, majority of the participants (55.56%) always, 42.86% sometimes, and 1.59% never got a prescription before starting antibiotics. In our study, majority of the participants (60.32%) never, 35.71% sometime and 3.17% always stop taking the prescribed antibiotics after their symptoms improved. In our study, majority of the participants (54.76%) sometimes, 41.27% always and 3.17% never completed the course of the prescribed antibiotic treatment. In our study, majority of the participants (54.76%) sometimes, 41.27% always and 3.17% never take the correct dose of their antibiotics at the right time for the full duration. In case of missed dose, majority of

the participants (64.29%) sometimes, 21.43% always and 13.49% never take it as soon as possible when they remember before the time of next dose. In this study, majority of the participants (47.62%) never, 43.65% sometimes and 7.14% always save the remaining antibiotics for next time they get sick. In this study, majority of the participants (73.02%) sometimes, 13.49% always and 12.70% never give leftover medication to friends or family if they get sick. For cough or sore throat, majority of the participants (48.41%) sometimes, 32.54% always and 18.25% never prefer taking an antibiotic. In this study, majority of the participants (69.05%) never, 18.25% sometimes and 11.90% always buy the same antibiotics if they are sick that helped them get better when they had the same symptoms before. In our study, most of the participants (96.03%) always check and 3.17% sometimes check the expiry date of the antibiotic before using it. Table IV demonstrates the distribution of participants about total knowledge and attitude level. Knowledge level of antibiotic in majority of the participants (47.62%) was very good, followed by 26.98% had good, 16.67% had poor and 8.73% had excellent knowledge level. Knowledge level of antibiotic resistance in majority of the participants (54.76%) was very good, followed by 23.02% had good, 15.8% had poor, and 6.35% had excellent knowledge level. Attitude level of antibiotic usage in majority of the participants (34.13%) was average, followed by 32.54% had bad, 32.54% good attitude level.
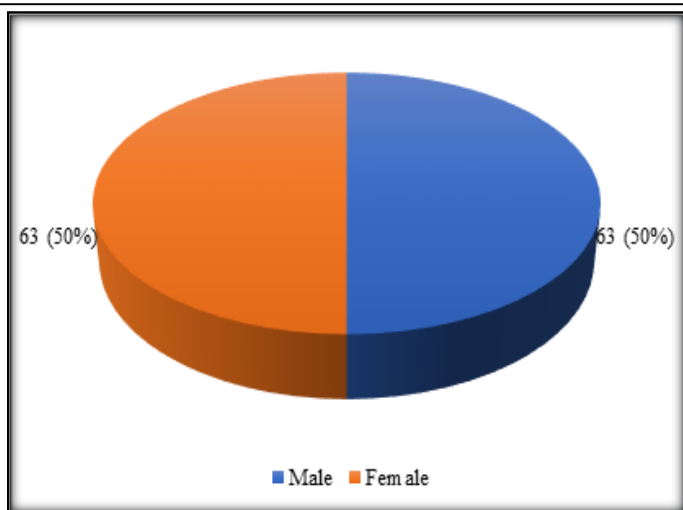
Figure 1: Sex distribution of the study subjects.
(N=126)

Table 1: Distribution of participants about knowledge on antibiotics. (N=126)

Statements regarding questions on antibiotics		n	%
Antibiotics are safe drugs, hence can be commonly used medications	True	29	23.02
	False	96	76.19
	Do Not know	1	0.79
Broad spectrum antibiotics are more preferred for the treatment of bacterial infection	TRUE	94	74.60
	FALSE	31	24.60
	Do Not know	1	0.79
Antibiotics are not effective drugs for the treatment of fever	TRUE	118	93.65
	FALSE	8	6.35
	Do Not know	0	0.00
There is no difference between coamoxiclav (Amoclan) and Amoxicillin	TRUE	3	2.38
	FALSE	119	94.44
	Do Not know	4	3.17
Antibiotics should only be used when prescribed	TRUE	123	97.62
	FALSE	2	1.59
	Do Not know	0	0.00
Antibiotics are not supposed to kill all bacteria in the body	TRUE	98	77.78
	FALSE	28	22.22
	Do Not know	0	0.00
The body can usually fight mild infections on its own without antibiotics	TRUE	122	96.83
	FALSE	3	2.38
	Do Not know	1	0.79
	TRUE	118	93.65
	FALSE	4	3.17

Susceptibility tests helps to determine the likelihood that a particular antibiotic will be effective in treatment of a certain bacterial infection.	Do Not know	4	3.17
Antibiotics treat infections from fungi, virus and bacteria	TRUE	3	2.38
	FALSE	121	96.03
	Do Not know	1	0.79

Table 2: Distribution of participants about knowledge on antibiotic resistance. (N=126).

Statements on antibiotic resistance		n	%
Bacteria can become resistant to antibiotics	Yes	116	92.06
	No	10	7.94
	Do not Know	0	0.00
People can become resistant to antibiotics	Yes	66	52.38
	No	60	47.62
	Do not Know	0	0.00
The more antibiotics we use in society, the higher is the risk that resistance develops and spreads.	Yes	120	95.24
	No	5	3.97
	Do not Know	1	0.79
Non-compliance does not contribute to the development of antibiotics resistance.	Yes	6	4.76
	No	82	65.08
	Do not Know	38	30.16
Resistance can spread from animals to humans.	Yes	113	89.68
	No	9	7.14
	Do not Know	4	3.17
Resistance can spread from person to person.	Yes	95	75.40
	No	20	15.87
	Do not Know	11	8.73
Today, antibiotics resistance is not a big problem in the world.	Yes	1	0.79
	No	125	99.21
	Do not Know	0	0.00
Taking antibiotics correctly may reduce the risk of antibiotic resistance	Yes	124	98.41
	No	2	1.59
	Do not Know	0	0.00
Antibiotics should be stopped immediately when the patient is clinically improved to reduce the risk of resistance	Yes	11	8.73
	No	115	91.27
	Do not Know	0	0.00
As a student in the medical line and also a member of the society do you think you have a role to play in decreasing the prevalence of antibiotic resistance?	Yes	125	99.21
	No	1	0.79
	Do not Know	0	0.00

Table 3: Distribution of participant's attitude toward the usage of antibiotics. (N=126)

Statements on the usage of antibiotics		n	%
Do you always get a prescription before starting antibiotics?	Always	70	55.56
	Sometime	54	42.86
	Never	2	1.59
Do you stop taking the prescribed antibiotics after your symptoms improved?	Always	4	3.17
	Sometime	45	35.71
	Never	76	60.32
Do you complete the course of the prescribed antibiotic treatment?	Always	52	41.27
	Sometime	69	54.76
	Never	4	3.17
Do you take the correct dose of your antibiotics at the right time for the full duration?	Always	52	41.27
	Sometime	69	54.76
	Never	4	3.17
In case of missed dose, do you take it as soon as possible when you remember before the time of next dose?	Always	27	21.43
	Sometime	81	64.29
	Never	17	13.49
Do you save the remaining antibiotics for next time you get sick?	Always	9	7.14
	Sometime	55	43.65
	Never	60	47.62
Do you give leftover medication to friends or family if they get sick?	Always	17	13.49
	Sometime	92	73.02
	Never	16	12.70
Do you prefer taking an antibiotic when you have cough or sore throat?	Always	41	32.54
	Sometime	61	48.41
	Never	23	18.25
Do you buy the same antibiotics if you are sick that helped you get better when you had the same symptoms before?	Always	15	11.90
	Sometime	23	18.25
	Never	87	69.05
Do you check the expiry date of the antibiotic before using it?	Always	121	96.03
	Sometime	4	3.17
	Never	0	0.00

Table 4: Distribution of participants about total knowledge and attitude level. (N=126)

		n	%
Knowledge level of antibiotic	Poor	21	16.67
	Good	34	26.98
	Very Good	60	47.62
	Excellent	11	8.73
Knowledge level of antibiotic resistance	Poor	20	15.87
	Good	29	23.02
	Very Good	69	54.76

	Excellent	8	6.35
Attitude level of antibiotic usage	Bad Attitude	41	32.54
	Average Attitude	43	34.13
	Good Attitude	41	32.54

DISCUSSION

The most often prescribed medications are antibiotics, although they are frequently mishandled.[21] Antibiotic resistance is spreading around the world and is becoming a bigger issue.[22] The knowledge and attitude regarding the use of antibiotics and its resistance is not sufficient among people. The current study was conducted to assess the knowledge and attitude toward antibiotic use and resistance among 4th year students of Shaheed Monsur Ali medical college. In our study, the percentage of male and female was same. In knowledge on antibiotics, 23.02% participants knows that antibiotics are safe drugs, hence can be commonly used medications, 74.60% knows that broad spectrum antibiotics are more preferred for the treatment of bacterial infection, 93.65% knows that antibiotics are not effective drugs for the treatment of fever, 2.38% knows that there is no difference between coamoxiclav (Amoclan) and Amoxicillin, 97.62% knows that antibiotics should only be used when prescribed, 77.78% knows that antibiotics are not supposed to kill all bacteria in the body, 96.83% knows that the body can usually fight mild infections on its own without antibiotics, 93.65% knows that susceptibility tests helps to determine the likelihood that a particular antibiotic will be effective in treatment of a certain bacterial infection, and 2.38% knows that antibiotics treat infections from fungi, virus and bacteria. Knowledge level of antibiotic in was very good in 47.62% participants and poor in 16.67% participants. In the study of Shrestha R et al,[23] in response to survey question, "antibiotics are safe drugs; hence they can be used commonly", 22.8% disagreed which is in line with our study. Regarding knowledge level, Zulu A et al,[24] found that majority of the participants 227 of 260 (87.3%) had good knowledge and while 33 of 260 (12.7%) had poor knowledge. In knowledge on antibiotic resistance, we found that the students had more knowledge about the role to play in decreasing the prevalence of antibiotic resistance, taking antibiotics correctly may reduce the risk of antibiotic resistance, more use of antibiotics in society can higher the risk that resistance develops and spreads, resistance of bacteria to antibiotics, spread of resistance from animals to humans and from person to person and resistance of people to antibiotics. The students had less knowledge on the requirement to stop taking antibiotics immediately when the patient is clinically improved to reduce the risk of resistance, non-compliance does not contribute to the development of antibiotics resistance and antibiotics resistance is not a big problem in today's world. Knowledge level of antibiotic resistance in majority of the participants (54.76%) was very good. In the study of Gupta MK et al,[25] majority of the students were aware about the mechanism of antibiotic resistance. The study of Zulu A et al,[24] reported an overall good knowledge of antibiotic use and resistance which is similar to our study. Another study of

Dutt HK et al,[26] reported familiar findings in India. In attitude toward the usage of antibiotics, majority of the participants (55.56%) always get a prescription before starting antibiotics. In our study, majority of the participants (60.32%) never stop taking the prescribed antibiotics after their symptoms improved. In our study, majority of the participants (54.76%) sometimes completed the course of the prescribed antibiotic treatment. In our study, majority of the participants (54.76%) sometimes take the correct dose of their antibiotics at the right time for the full duration. In case of missed dose, majority of the participants (64.29%) sometimes take it as soon as possible when they remember before the time of next dose. In this study, majority of the participants (47.62%) never save the remaining antibiotics for next time they get sick. In this study, majority of the participants (73.02%) sometimes give leftover medication to friends or family if they get sick. In the study of Zulu A et al,[24] the majority of the medical students (81.5%) disagreed that it is better to stop a course of antibiotics immediately when symptoms of illness get resolved. The findings of our study are similar to the findings of another study of Bharath et al,[27] who reported that the majority of the medical students (75%) were aware that it is important to complete a course of antibiotics. Kanneppady et al,[28] reported that 87.6% of the medical students were aware that it is mandatory to complete the full course of antibiotics even if the symptoms resolved. For cough or sore throat, majority of the participants (48.41%) sometimes prefer taking an antibiotic. In this study, majority of the participants (69.05%) never buy the same antibiotics if they are sick that helped them get better when they had the same symptoms before. In our study, most of the participants (96.03%) always check the expiry date of the antibiotic before using it. Attitude level of antibiotic usage in majority of the participants (34.13%) was average, followed by 32.54% had bad, 32.54% good attitude level. In a study of Nisabwe L et al,[29] 15% of students reported to have used antibiotics to treat fever. These findings are consistent with the study conducted in Trinidad and Tobag.[30] In a study of Nisabwe L et al,[29] 27% of respondents used antibiotics to treat cold and sore throat also.

Limitations of The Study: In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time.

CONCLUSIONS

From the findings of the study, it can be concluded though the knowledge level of the medical students is adequate, they are not careful about the usage of antibiotics and often misuse it. The students tend to not follow the rules of the usage guideline of antibiotics which ultimately results in antibiotic resistance. They should be more conscious to follow the guidelines of antibiotic usage. Further study with larger sample size is required to have better understanding.

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