

RESEARCH ARTICLE

Assessment of Knowledge Regarding Antibiotic Use, its Resistance, and Future Consequences among Higher Secondary Students in Private Schools of Kathmandu Valley

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ABSTRACT

Antimicrobial resistance poses a growing threat to public health, as infections from resistant strains of microbial become increasingly difficult and expensive to treat, resulting in prolonged illness and greater risk of death. A cross-sectional descriptive study was done among 471 higher secondary level students of private schools in Kathmandu Valley. Data were collected from Grade 11 and 12 non-science faculty students through self-administered questionnaires. Half (50.5%) of the students gave correct response by saying that antibiotic kills bacteria and 49.1% said that it is for fever. Majority (93.0%) of them said that it should be taken with water. Regarding the response on when to stop taking antibiotic, 46.9% said correctly by saying when all prescribed medicines are taken whereas and 40.8% said that after feeling better. More than half (58.8%) of the students had not heard about antibiotic resistance, whereas those who have heard among them 24% of students said that they had heard from doctor and nurses and 21.8% from family member and friends. Nearly one-third (32.7%) of students knew that antibiotic resistance occurs using antibiotic when they are not necessary. Regarding the response on consequences of antibiotic resistance, more than one-third (38.2%) of students gave correct answer. Nearly half of the students have lack of knowledge about antibiotic. Thus, it is imperative to create awareness among students by introducing a specific course on antibiotic in the 9th and 10th grade core curriculum to prevent antibiotic resistance and its consequences.

Keywords: Antibiotic resistance, antibiotic use, antibiotic, future consequences

INTRODUCTION

Antibiotics resistance in many ways a very frightening issues and finding solution to problem caused by these infections can be a daunting task.^[1] By examining the ways, antibiotic resistance can be minimized and controlled and hope for a healthier and safer future.^[2] There is an urgent need for more investment in research and development

for antibiotic-resistant infections including TB; otherwise, we will be forced back to a time when people feared common infections and risked their lives from minor surgery.^[3]

Antimicrobial resistance (AMR) is one of the most serious health threats. Infections from resistant bacteria are now too common, and some pathogens have even become resistant to multiple types or classes of antibiotics. When the first-line and then second-line antibiotic treatment options are limited by resistance or are unavailable, health-care providers are forced to use antibiotics that may be more toxic to the patient and frequently more

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expensive and less effective. Even when alternative treatments exist, research has shown that patients with resistant infections are often much more likely to die, and survivors have significantly longer hospital stays, delayed recuperation, and long-term disability.^[4] Antibiotic resistance is accelerated by the misuse and overuse of antibiotics, as well as poor infection prevention and control.^[5]

If the appropriate steps are not put forward immediately, the arrival of post antibiotic era is inevitable, when the patient will die even with the infections which are considered minor. In Nepal, the AMR surveillance is not up to the mark, since its commencement. There is an urgent need of collaboration between the department of health services (Ministry of Health), department of livestock services (Ministry of Livestock Development), and Ministry of Population and Environment for having joint surveillance program.^[6]

A very few research work has been done in Nepal about antibiotic resistance and future consequences among non-medical students. Numerous people use antibiotics in simple cold and cough and sometimes they do not complete the dose of antibiotics.^[7] Hence, this study would be an important reference for determining the scope of the problem which will be essential for formulating and monitoring an effective response to antibiotic use and its problem of resistance. Hence, the purpose of this study is to assess awareness of higher secondary students regarding antibiotic use and the threat or future consequences that antibiotic resistance poses and to encourage immediate action to address the threat.

MATERIALS AND METHODS

A cross-sectional descriptive study was done in November 2017 among 471 higher secondary level students of private schools in Kathmandu Valley. Among 185 private higher secondary schools of Kathmandu valley, five schools were selected whose management were supportive. From each school, all Grade 11 and 12 students of non-science group were selected for this study. Convenience sampling technique was used. Data were collected from Grade 11 and 12 non-science faculty

students through self-administered questionnaires. Descriptive statistics were used to find out the knowledge level of the students.

Data collection tool

Semi-structured questionnaire was developed after reviewing the related literature to obtain the information regarding knowledge of antibiotic use, its resistance, and future consequences and questions were divided into two parts:

- Section A: Questions related to the sociodemographic variables
- Section B: Questions related to the knowledge of antibiotic use, its resistance, and future consequences.

The adequacy and accuracy of content of the instrument were established by designing the questionnaire based on the study objectives, taking help from the previous literature and studies. Instrument was formed in English language and opinion of the language expert was obtained for comprehensibility and simplicity of language. The reliability of the instrument was established by pre-testing the instrument on 10% Grade 11 and 12 students in the similar but not the same setting. Table 1 shows demographic data included age, gender, educational status, and socioeconomic status. Each question (apart from those included in the demographic data section) was in a format of five possible answers (accepting only one right answer), according to the 5-point Likert scale: 1 = strongly agree, 2 = agree, 3 = uncertain, 4 = disagree, and 5 = disagree strongly or 1 = always, 2 = most of the times, 3 = often, 4 = sometimes, and 5 = never.

Data collection procedure

Written permission was taken from concerned private higher secondary schools before the study. The schedule for data collection was prepared according to the suitable date and time (after lunch i.e., 1 pm) by consulting each school's administration. The students of Grade 11 and 12 of each school were kept in their own separate classrooms. Researchers gave their introduction, stated the objective of the data collection, and

Table 1: Semi-structured questionnaire sociodemographic information

➤ Age (in years)
➤ Gender
➤ Grade
➤ Stream
➤ Father's income

1. Questions about knowledge, attitude, and practice about antibiotic resistance, its use, and correlation with one health concept
2. Antibiotics are powerful medicines that are used to kill bacteria?
3. Antibiotics are used to treat cough and cold?
4. Vomiting, headache, diarrhea, abdominal pain, etc., are the common side effects of antibiotics?
5. Do you imagine the future without antibiotics to be dangerous for living beings?
6. Do you think you should stop taking antibiotics when you feel better once you've begun a treatment?
7. We die if we get an antibiotic resistant infection?
8. You often take antibiotics no matter what the illness is?
9. Have you heard of any of these terms such as antimicrobial resistance, antibiotic resistance, drug resistance, or antimicrobial resistance?
10. Is the efficacy better if antibiotics are newer and more costly?
11. Do you think frequent use of antibiotics will decrease efficacy of treatment when using the antibiotics again?
12. There is abuse of antibiotics at present?
13. Abuse of antibiotics has become the main cause leading to bacterial resistance?
14. Antibiotic resistance affects you and your family's health?
15. Is there a need to establish course on rational use of antibiotics at high school level?
16. Scientists can produce new antibiotics for resistant bacteria?
17. Parents and medical health professionals should be informed about judicious antibiotic use?
18. Should we ask the physician about the necessity of prescribing antibiotics?
19. Would you change your physician if he/she didn't prescribe antibiotics?
20. Do you think transfer of resistant bacteria from animal to human or vice versa is possible?
21. Do you agree with the fact that low dose antibiotic should be condemned because it favors antibiotic resistance?
22. Do you agree that antibiotic residues are found on food supply?

provided information on how to fill the self-administered questionnaire (they were also told that they were free to ask in between questionnaire filling if any difficulty arose) to the respective classroom students. Informed verbal consent was taken from students before data collection. The students were assured of the confidentiality of the information given by them. The students were told that they are allowed to refuse to participate in

the study at any time if they wish. Then, the self-administered questionnaires were distributed to the students. It took nearly ½ h to fill the questionnaire, and then, the students were thanked for their kind cooperation and providing the time for data collection. It took 5 days to collect data from five schools as each day was allocated for one school.

Data analysis

The collected data were coded and entered in computer software package (SPSS 21.0) program. The data analysis was done using descriptive statistics. Findings were interpreted through percentage and frequency tables to show the students' knowledge level.

Ethical considerations

Ethical approval was obtained from research committee of TU, IOM. Permission was obtained from the concerned authority of higher secondary colleges. Purpose of the study was explained and written consent was taken from the students. Information obtained was used for the study purpose. The students were allowed to refuse to participate in the study at any time they want.

RESULTS AND DISCUSSION

In this study, the mean age of the students was 17.19 years. About 52% were male and 71.1% were from Grade 12. Half (50.5%) of the students gave correct response by saying that antibiotic kills bacteria and 49.1% said that it is for fever. Majority (93.0%) of them said that it should be taken with water. About 47% of students said that headache is the side effect of antibiotic while 30.6% said vomiting, whereas 10.5% were unaware of the side effects. Regarding the response on when to stop taking antibiotic, 46.9% said correctly by saying when all prescribed medicines are taken whereas and 40.8% said that after feeling better. More than half (58.8%) of the students had not heard about antibiotic resistance, whereas those who have heard among them 24% of students said that they had heard from doctor and nurses and 21.8% from family member and friends.

Nearly one-third (32.7%) of students knew that antibiotic resistance occurs using antibiotic when they are not necessary. Regarding the response on consequences of antibiotic resistance, more than one-third (38.2%) of students gave correct answer. According to Santimano and Foxcroft (2016) survey of high school students in Goa, India, overall, antibiotic knowledge was poor, with 49% of students either wrongly thinking or unclear that bacteria cause colds/flu. Most (82%) students thought that antibiotics killed harmful viruses, 35% thought that antibiotics do not kill harmful bacteria, and 79% thought that antibiotics do not kill harmless bacteria. Most (67%) were unaware of the problem of antibiotic resistance.^[8]

According to antibiotic resistance, multicountry public awareness survey conducted in the WHO 12 member states – face-to-face street interview was taken in the 9772 respondents – reported that antibiotic use is higher in the lower income countries included in the survey. About 25% of respondents across the 12 countries included in the survey think that it is acceptable to use antibiotics that were given to friend, family member, as long as they were used to treat the same illness. About 43% think that it is acceptable to buy the same antibiotics or request these from a doctor, if they are sick and antibiotics helped them get better when they had the same symptoms before. About 32% of respondents think that they should stop taking antibiotics when they feel better, not when they have taken all of them as directed.^[9]

Another study done on knowledge and attitude toward antibiotic use and resistance – a latent class analysis of a Swedish population-based sample mentioned that antibiotic treatment is a pre-requisite for modern healthcare. For this study, questionnaire was sent to by post in 2013–25,000 randomly selected individuals aged 18–74 living in Sweden and overall response rate was 57% out of which 94% knew that bacteria become resistance to antibiotics, <70% answered the questions regarding side effects correctly, and even fewer <50% of respondents correctly to questions regarding how antibiotics resistance can spread. A minority 12% answered correctly “no” to the statements – people can become resistant to antibiotics. Moreover, they have concluded that people with lower education

and the elderly are especially in need of improved knowledge about antibiotic use and resistance.^[10] Similar study conducted on antibiotic use: A cross-sectional survey assessing the knowledge, attitudes, and practices among students of a school of medicine in Italy among medical, dental, and nursing health-care professionals students of the school of Medicine where 1050 were interviewed and concluded that around 20% of the sample stated that antibiotics are appropriate for viral infections and 15% of the students that they stop taking those drugs when symptoms decrease. Results of the multivariate analyses showed that females were more likely than males to take antibiotics only when prescribed (OR 1.43, 95% CI 1.04–1.98). Interestingly, students with a relative working in a health-related field, as well as those who took at least one course of antibiotics in the past year, had a lower probability of taking those drugs only under prescription (OR = 0.69 95% CI: 0.49–0.97 and OR = 0.38 95% CI: 0.27–0.53, respectively). Moreover, the study has concluded that health-care profession students do not practice what they know. Since those students will be a behavioral model for citizens and patients, it is important to generate more awareness around this issue throughout their studies and would be advisable to introduce a specific course and training on antibiotics in the core curriculum of the School of Medicine.^[11] A cross-sectional survey of public knowledge and attitudes with regard to antibiotics in Poland: Did the European antibiotic awareness day campaigns change attitudes? was conducted among general public in Poland in five waves between 2009 and 2011 embracing a total of 5004 respondents showed that 3% of the respondents purchased an antibiotic without a prescription. Approximately 40% of the respondents expected prescriptions for an antibiotic against the flu. The vast majority knew antibiotics kill bacteria (80%), but at the same time, 60% of respondents believed that antibiotic kills viruses.^[12]

CONCLUSION

Nearly half of the students have lack of knowledge about antibiotic. Thus, it is imperative to create awareness among students by introducing a specific

course on antibiotic in the 11th and 12th grade core curriculum to prevent antibiotic resistance and its consequences.

LIMITATION OF STUDY

The study was conducted on higher secondary level students of non-science group. Only non-medical students were studied.

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