

Knowledge, attitude and practice of antibiotics among students

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ABSTRACT

Antibiotics are the medications which help to kill microorganism. Irrational use of antibiotics is alarmingly increasing throughout the globe resulting in growing crisis of antibiotic resistance. Knowledge, attitude and practice of antibiotics use might have great impact antibiotic related issues, like adverse reactions and antibiotic resistance is main problem arising nowadays. Antibiotic resistance is arising mainly due to misuse of antibiotics, self administration without physician's prescription and lack of knowledge etc. So, it is essential to determine the community knowledge and also factors associated with less knowledge related to antibiotics.

INTRODUCTION

Antibiotic means "against life" any medicine that kills the microorganism in our body is called an antibiotic [1]. Infectious diseases that can be manage with antibiotics are ear and sinus infections, tooth infections, meningitis, throat , bacterial pneumonias, soft tissue infection, bladder, kidney infections and many others [1]. Antibiotic_resistance is the adaptive change in bacterial mutations which allow the bacteria despite presence of antibiotics that usually slows their growth or kills them [2]. These antibiotic resistant pathogens are difficult to treat, resulting increased morbidity and thus there is a need to change the drug therapy to get rid of disease [2]. Examples includes, vancomycin-resistant enterococci (VRE) bacteria which are resistant to vancomycin and bacteria that cause sexually transmitted disease like gonorrhea (*Neisseria gonorrhoea*) also resist the therapeutic effect of antibiotics [2].

Since their discovery, antibiotics have significant role for the control and treatment of infectious diseases [3]. Antibiotics are one of the largest sold drugs in the developing countries [4]. Countless patients have been taken antibiotics either therapeutically or prophylactically [3]. The improper use of antibiotic is a growing concern resulting in development of resistant in bacterial strains [5].

Overuse and underuse of antibiotics or prescribing them without a reason can result in resistance of bacterial strains and could also increase the chance of adverse reactions which leads to economical burden on national health system [6]. In India, self medication with antibiotics is highly prevalent. Increase self medication practice results in wastage of resource, resistance of pathogens, adverse reactions, wrong diagnosis without physician consultation, high likelihood of dependence and drug abuse.

Patient knowledge, beliefs, attitude, their expectation with antibiotics is a major associated factor for the growing crisis of resistant bacterial strains. The students can play a significant role in decreasing the improper use of antibiotics [5]. Decreased the improper use is the key to keep antibiotics effective and this is an important aspect of a national action plan. At the same time, a large proportion lack access to effective antibiotics, therefore it is essential to increase access to appropriate antibiotics. As antibiotics are OTC medications, so people must know their uses, adverse reactions, frequency of dosage and duration of antibiotic course to get rid of infection. This study helps to determine knowledge of students of different fields related to antibiotics. The Centers for Disease Control and Prevention (CDC) calls it "one of the world's most pressing public health problems"[5]. It's especially a concern in low-income and developing countries. It is necessary that today's youth should know about antibiotics and their proper usage [6]. In 2011, "WHO set the theme of World Health Day as Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow", which shows a major issue of antibiotic abuse and thus there is a need to develop some plan for prevention of antibiotic resistance. This also shows the need to educate people regarding use of antibiotics [7].

Antibiotics are commonly used drugs as they treat and prevent several bacterial infections but, their irrational use like prescription of incorrect doses, self- medication and treatment of non bacterial illness leads to several problems. For example, penicillin can cause diarrhea, nausea, skin rashes and hives. Aim of any antibiotic therapy is to attain required outcomes in patients however non- compliance of patients is a big problem in achieving it. "The World Health Organization defines the concept of compliance needed to fulfill some behaviors like taking prescribed medication, healthy lifestyle, following the recommendations provided by physician or else, non- compliance exists" [8]. Non- compliance is discontinuation of treatment course and failure to adhere the prescribed therapy by the patient, examples include frequent alteration in the therapeutic procedure, defectively performing the diagnostic tests, unable to enhance lifestyle or diets [8]. Various factors such as patient's educational status, low price of antibiotics, shorter duration of treatment, inadequate doses, inappropriate dosage form of antibiotics for the patients, lack of adverse effects knowledge and commitments were found to be responsible for drug noncompliance [9]. In methods of improving compliance author stated that simple ways like taking medication in accordance to physician's direction, decreased physical activity or rest, information from physician about side effects and their further result on continuation of therapy [9].

As per a study conducted by Alemnesh Jifar et al, documented that good proportion of respondents (96%) agreed that a single antibiotic can not be used for all infectious disease and 83% of them have a misunderstanding that antibiotics treat cough [3]. People of community also had sound knowledge of antibiotic resistance as 78.4% of participants admitted that inappropriate use may lead increase the emergence of resistant bacteria. In another similar study, authors compared the antibiotic knowledge among medical (65%) and non-medical students [5,3] as medical students have so basic knowledge so their score is

high [5]. As we know that antibiotic resistance is a global health threat and for this reason antibiotic knowledge is necessary in today's world. Antibiotic resistance is the decreased the effect of antibiotic against previously susceptible bacteria and main causes of antibiotic resistance includes over prescription of antibiotics, antibiotic course not being completed by patients, overuse of antibiotics in livestock or fish cultivation, poor knowledge infection management in health care setting, poor hygiene or sanitation and lack of invention of new antibiotic [10]. A study by Ying Huang et. al., found that medical students have good knowledge of antibiotic use as compared to non- medical students and 92.93% of students think that antibiotic can be use in the treatment of bacterial infection [7]. However, majority of medical students (64.52%) believe that antibiotics cannot treat viral infections whereas, 43.44% non- medical students believes the same, this could be because medical students have knowledge that structure of virus is a barrier to antibiotic action and it is more effective in bacteria [7] whereas, a study conducted in a community of Jordan in 2012, revealed that only 47.3% of respondents expressed correct response on knowledge [4]. Confusion among participants regarding the action of antibiotic against bacteria and virus was clear, however many people do not know the exact differences between bacteria and virus and think that drug is effective against both [4]. So, the basic knowledge is also important to understand the action of antibiotics because if patients take antibiotics for viral infection it would not cure the infection thus causing unnecessary antibiotic resistance.

Reported study from UAE, the author stated that medical students have positive attitude (76%) towards proper use of antibiotics [5]. Antibiotic abuse or sometimes called as antibiotic overuse impact a serious effect on health, it is a contributing parameter to drug resistance leading to creation of multidrug- resistance bacteria, also called super bugs. "As per a study conducted in china, 82.84% of medical students and 62.80% of non- medical students said that antibiotic resistance has become a problem in their country and 83.88% of medical stream students believed that abuse of antibiotics was the main reason of antibiotic resistance while only 61.75% of non- medical students think so" [4]. In a community study, it was found that 92.1% respondents believed on importance of completing antibiotic course and not to store antibiotics for future use (87.2%) however 17% of respondents believed in keeping antibiotics at home for future use [3]. In this study respondents also show a positive attitude towards ways of getting antibiotics. 90% of people consult physician before purchasing antibiotics and 73.1% purchase antibiotics on prescription [3]. In a study author stated that 16.1% of participants took antibiotics before meal while majority (94%) took antibiotics with water [4]. Female attitude toward antibiotics use in pregnancy and lactation was also accessed in this study 12% of females believed that antibiotics are safe during pregnancy and 35% believed that it is safe during lactation [4].

It is interesting to note that in a study conducted in china, medical students have poor behavior toward antibiotic use as compare to non- medical students however, a majority of medical students (75.29%) used prescription to buy antibiotics as compare to non- medical students (49.46%) [7]. In India, antibiotics are available as OTC medications which increase the risk of self medication practices and antibiotic resistance.

OTC drug without consultation of doctor and taken as self medication leads to certain consequences like side effects, resistance of bacteria, risk of dependence and abuse etc. “About 76% of population use antibiotics without physician’s prescription in India [11], 32.7% in Italy [12], 28.8% in Saudi Arabia [13], and 9% in Hong Kong [14], this difference could be due to the variation of rules and regulation from one area to another and its enforcement [3]. Another study reported that average practice score of medical and non medical students is 45%, out of which medical students scored (47%) and non medical students scored (43%) [5]”. According to a study conducted in Jordan, self medication was one of the key problems, 28.5% of participants stored antibiotics at home for emergency purpose and about half population (49%) agreed that they use leftover antibiotics [4]. No doubt, self- medication offers several benefits like decreased hospital expenses and increased access to medications, but it is a poor practice as it includes incorrect self- diagnosis, rare, but severe adverse reactions, wrong way of drug administration, risk of dependence or abuse, masking a disease, delay in seeking medical advice and many more. It has been proven that awareness about antibiotic resistance is less in developed countries when compared to developing countries. Countries like Sweden, Netherland had less prevalence of antibiotic use this could be due to the higher knowledge of antibiotic.

Talking about law and policies, a recent study reported that due to antibiotic resistant there will be 10 million deaths by 2050. It is also expected that “\$100 trillion of the world’s economic outcome will be lost if the policy makers don’t intercede to find an appropriate measure to overcome this key problem [15]. When data started to show an enhancement in antibiotic resistance in the world, Saudi Arabia started a policy to prevent dispensing of antibiotics without prescriptions”. The proportion of pharmacists who dispensed antibiotics non prescription drugs was drastically reduced from “97.9 % in 2011 to 63% in 2015” [15]. So, it is an example that how law regulates the practice of antibiotic dispensing and thus it becomes useful in overcoming the antibiotic resistance problem.

REFERENCES

1. A. Jifar, and Y. Ayele, “Assessment of Knowledge, Attitude, and Practice toward Antibiotic Use among Harar City and Its Surrounding Community, Eastern Ethiopia,” *Interdisciplinary perspectives on infectious diseases*, vol. 2018, 2018.
2. M. Shehadeh, G. Suaifan, R. M. Darwish *et al.*, “Knowledge, attitudes and behavior regarding antibiotics use and misuse among adults in the community of Jordan. A pilot study,” *Saudi Pharmaceutical Journal*, vol. 20, no. 2, pp. 125-133, 2012.

3. Y. Huang, J. Gu, M. Zhang *et al.*, “Knowledge, attitude and practice of antibiotics: a questionnaire study among 2500 Chinese students,” *BMC medical education*, vol. 13, no. 1, pp. 163, 2013.
4. P. Kardas, “Patient compliance with antibiotic treatment for respiratory tract infections,” *Journal of antimicrobial Chemotherapy*, vol. 49, no. 6, pp. 897-903, 2002.
5. M. M. Rao, “assessment of public knowledge and attitude regarding antibiotic use in a tertiary care hospital,” *assessment*, vol. 9, no. 1, 2016.
6. F. Napolitano, M. T. Izzo, G. Di Giuseppe *et al.*, “Public knowledge, attitudes, and experience regarding the use of antibiotics in Italy,” *PloS one*, vol. 8, no. 12, 2013.
7. A. S. Aldhafar, and W. Talat, “Knowledge, Attitude, and Practice toward the Usage of Antibiotics among Public in Al-Ahsa, Saudi Arabia,” *Target*, 2016.
8. C. Chen, Y.-M. Chen, K.-L. Hwang *et al.*, “Behavior, attitudes and knowledge about antibiotic usage among residents of Changhua, Taiwan,” *J Microbiol Immunol Infect*, vol. 38, no. 1, pp. 53-59, 2005.

