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Study on awareness, knowledge, and practices towards antibiotic use among the educated and uneducated people of Khyber Pakhtunkhwa Province, Pakistan

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ABSTRACT

Introduction: Antimicrobial resistance developed through the inadequate use of antibiotics; is an overriding task for global public health. **Objective:** To explore awareness, knowledge, and practices, and compare the elements associated with antibiotic misuse in different University students and uneducated people of Khyber Pakhtunkhwa Province, Pakistan. **Methods:** Cross-sectional study was conducted from July to December 2020 using a validated questionnaire. Data were collected from eleven different university students and uneducated people of Khyber Pakhtunkhwa, Pakistan. **Results:** 3,600 questionnaires were completed, consisting of 56.9% Male and 43.0% Female. 1,999 (55.5%) of the antibiotic users reported through the survey used non-prescription antibiotics within a one-month study period. Out of the participants, 230 (6.3%) were uneducated or their education level was below matric rest were university students. 1999 (55.5%) reported buying Antibiotics with Medical Prescription. Most self-medicated participants (56.9%) stop taking antibiotics when they feel better. More than 90% of the respondents answered that doctors and pharmacist staff do not guide them well that how to use antibiotics. 2,171 (60.03%) respondents mistakenly believed that antibiotics improve restoration from coughs and colds. Only 720 (20%) respondents knew that antibiotics also disturb normal flora and 547 participants (15.9%) agree that unnecessary use of antibiotics causes bacterial resistance. **Conclusion:** Finding from this study may have important implications for public health policy in Khyber Pakhtunkhwa, Pakistan given the growing global resistance to antibiotics and the reported health issues related to their improper use.

Keywords: drug resistance, microbial; cross-sectional studies; delivery of health care; awareness; early diagnosis; self-medication; antibiotics.

INTRODUCTION

Antibiotics are considered a weapon against microbial infections, but sometimes these can present danger to life because of improper use of them. Self-medication can be described as the use of medicine for the treatment of self-diagnosed disorders by consulting a medical practitioner without any medical supervision[1,2]. Drug regulations affecting antibiotic availability are implanted differently in various countries and could play a critical role in confusion about antibiotic usage[3].

Currently, a large portion of the population is using antibiotics without any doctor's prescription. The use of un-prescribed antibiotics has become a significant global public health concern in recent years, which is called antimicrobial resistance. When pathogenic microorganisms will multiply on the face of invading antimicrobials beyond a certain critical mass, the treatment outcome, which we compromised, is termed antimicrobial resistance[4,5].

Antimicrobial resistance can endanger life, it causes an increase to stay in the hospital, kidney problems, and also a burden on the Government. According to the rules of Darwin's evolution, antimicrobial use produces selective pressure on microorganisms resulting in the removal of weak ones while stronger ones may adapt and survive. Antimicrobial resistance (AMR) seems to have been a growing challenge for years to the successful treatment of an ever-increasing variety of infections caused by microorganisms. Antimicrobial outcomes in a decreased effectiveness of antiviral and antibacterial drugs, making medical care challenging, costly, or even impossible.

The World Health Organization finds antibiotic resistance to be one of the most serious problems that have threatened public health in recent years[6]. The reason behind this is that antibiotics are available easily at every point, lack of knowledge and incomplete treatment course, or antibiotics guided by friends or relatives. More than fifty percent of antibiotics are bought

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without physician instruction in developing countries[7]. In the United States, The Centre for Disease Control and Prevention reports that at least two million people get sick due to antibiotic resistance and that some 23.000 people die as a direct cause of infection[8]. The government should strongly take action in this situation. Policies should be made for drug sellers to prevent drug selling without any medical prescription.

More information on antibiotic usage and antibiotic resistance should be provided by the pharmacist during their training. Also, awareness of the general population may reduce the chances of Antibiotic Resistance. Awareness can only be developed by organizing awareness seminars and workshops. Antimicrobial medicines that are both available and affordable may diminish the already limited therapeutic options for treating common infectious infections in developing nations, increasing the risk of morbidity and mortality[9,10].

Keeping in mind the serious problem, a study was conducted among the population of the KPK, Pakistan. The present work is aimed to determine the Awareness, attitudes, and behavior regarding antibiotic usage as well as self-reported practices which may help in designing the precautionary measures and organizing such activities that help control self-medication.

METHODS

Study population and data collection

Descriptive, cross-section analysis using a validated questionnaire. The validation processes have been completed using a representative sample, demonstrating adequate reliability and validity. ‘‘A study of awareness and practices towards antibiotic use in different universities of Khyber

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Pakhtunkhwa, Pakistan'' was carried out from July to December 2020 in different universities of the KPK, Pakistan.

This study has been approved by the Ethical Committee Abbottabad University of Science & Technology and registration No/AUST/Micro/2021/332.

Questionnaire design

The questionnaire was prepared after consultation with the faculty of the Abbottabad University, Department of Microbiology of various disciplines for a prior test to verify the understanding and clarification of the questions. In the questionnaire, participants such as age, gender, or education received demographic data. Genders of both males and females and different ages are included in the study. Participants of old age were excluded.

A total of 3,600 participants participated in this study. There were four sections of the questionnaire. The first part secures the participant's demographic merits. The second component becomes a designed part to take a look at the behavior of participants regarding antibiotics. Three options were given to Participants for the answer "Yes", "No" and ''Don't Know. Participants were asked to provide more information about antibiotic sources, share antibiotics with families and family friends, and save antibiotics for future uses. Section 3 of the questionnaire contained information about antibiotics from respondents. Three options for answering were given to participants: ''Agree'', ''Disagree'' and ''Don't Know''.

Statistical analysis

The data collected was organized, checked, entered into Microsoft Access, and analyzed using SPSS version 20.

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RESULTS

Demographic Characteristics of Respondents

Throughout the study period, a total of 3,660 questionnaires were filed by the general public. Yet 3,600 of the questionnaires were complete and the rest in this manner was excluded from analyses. Participant age, academic levels, and findings are mentioned as probabilities in Table 1. This table indicates that male accounted for (2050) 56.9% of the participants while females accounted for (1550) 43%.

Out of 3,600 participants, 2149 (59.6%) were undergraduate students, 819 (22.7%) were postgraduate students, 402 (11.1%) had completed primary education and 230 (6.3%) were uneducated (Table 1).

The analysis of questionnaire data showed that more than 55% of the people bought antibiotics without a medical prescription because they have taken into consideration their infection to be mild as the majority of the population used the medicines due to their own experience with the particular antibiotic. The majority of self-medicated participants avoid taking antibiotics when they feel better; they have not completed the course of antibiotics which is a very troubling situation. About 3,019 (83.86%) out of 3,600 participants declared that they kept antibiotics at home for emergency needs obtained from the network pharmacies without prescription (Table 2).

Table 3 shows another alarming condition is that more than 90% of the respondents answered that doctors and pharmacist staff do not guide well for a course of antibiotics and how to use antibiotics. Only 2,605 (72.36%) out of 3,600 respondents agree that antibiotics are effective against bacteria whereas 2,171 (60.03%) out of 3,600 respondents incorrectly thought that

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antibiotics are effective against coughs and colds. Additionally, 2,163 (60.08%) out of 3,600 respondents said that antibiotics can also be used against the remedy of viral infections. Only 1,090 (30%) participants replied that resistance to antibiotics is a worldwide problem. On other hand 547 (15.9%) agree with the term that the unnecessary use of antibiotics causes bacterial resistance.

Information on both the potential and the adverse effects of antibiotics was significantly lacking. Around 65% of participants accept that antibiotics have side effects and 20% recognize that antibiotics can lead to a reduction in the amount of bacterial flora that typically resides in our bodies such as skin and gut.

This study also showed that the main factors contributing were time-saving, smooth availability of used antibiotics on previous experience, and minor illness.

DISCUSSION

Self-medication is practiced worldwide resulting in high prevalence, but its range varies from place to place. Antibiotic resistance in countries with unprescribed antibiotics is now a significant public health problem[11]. In Khyber Pakhtunkhwa, Pakistan, there is also a high incidence of self-medication. Our study demonstrates that approximately 77% of the general population in KPK is self-medicated. In India's general public, our neighboring country, self-medication was estimated to be about 31 percent. Among university college students it was estimated to be up to 45% in Turkey, 88% in Croatia, and 94% in Hong Kong[12]. In Europe in 2006, a comparative study on gastroesophageal reflex was conducted and the incidence of self-medication was determined to be 68 percent[13]. In 2008, Aga Khan Medical students conducted research on the same issue among medical and non-medical students, which revealed a prevalence of 76%[14].

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This study also reported satisfactory results concerning antibiotic self-medication confirming that the burden of self-medication is high in low-middle-income countries compared with high-income countries[15]. Even trained individuals, including clinicians, believe antibiotics should be used for the treatment of the common cold[1,16]. The effects have proven that the general public who participated in this have to look at has much less expertise on the importance of antibiotics and their course of compilation. The superiority determined by way of our look is likewise quite high and needs to be taken critically. It unexpectedly turned out that there was no substantial difference between medical and non-medical students in the dominant expenses of self-medication. The ease at which antibiotics can be obtained by the collective, fellow staff, and family pharmacy is another contributing factor, which is because of a lack of needless disciplinary guidance. The most prevalent ailments or symptoms for which self-medication was used were the common cold, sore throat, fever, gastrointestinal tract diseases, and respiratory infections. In many investigations, fever and cold were identified as the most common health complaints that led to self-medication[17]. The observed excessive frequency of self-medication may be attributed to the fact that the antibiotics were known to people. In general, human malpractices such as inadequate dosing, incomplete course trials, and indiscriminate drug usage have contributed to antimicrobial resistance developing and spreading[18].

Education

Medical awareness had an immense role in finishing the course in medical aid. Several experts have concluded that a great deal of knowledge needs to be provided to the general public about antibiotics and the possible adverse effects that occur if antibiotics are used squarely without a prescription[19,20]. Such data are expected to help reduce the speed and encourage the safe use of

these medications' un-prescribed antibiotics. Awareness however does not always equate with behavior[21]. The value of such health education is further increased by a lack of awareness of the possible risks of inappropriate use of antibiotics in up to 49th of those interviewed[22]. According to the current study, 59.6% of undergraduates, 11.1% of elementary school students, and 6.3% of illiterate participants demonstrated the extent of medical knowledge in the local community.

Demographic

Known cluster validity demonstrated that females would be wise to information and understanding scores about anti-microbial use and anti-toxin obstruction when contrasted with males. There was a major difference noted between advanced educated participants and ethnic teams. Malaysian ethnicities showed sensible knowledge and comprehension scores when placed next to different ethnic teams, and the results were compared with other analyses conducted within Penang territory[23]. Our data also indicated that the self-medication phenomena was more widespread in the male population, with 56.9% of instances compared to 43% of cases in the female community.

Behavior

Another study indicated noteworthy contrasts in open perspectives, convictions, and levels of data concerning anti-biotic use, self-drug, and antibiotic resistance in Europe. Just 50 % of respondents usually knew about antibiotic resistance and that was the least in countries with higher resistance[24]. In the attitude segment, every understudy was offered a mentality score dependent on the responses given to various clarifications. A higher score revealed a dynamically negative self-medication mentality. Higher levels of clinical and drug awareness are making people more aware

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of the use and recommendation of medicines[25]. Current research indicates that 76.66% of the population is unaware about excessive antibiotic usage leads to bacterial resistance.

It is much easier to reduce the degree of resistance than to prevent its production. Priority must therefore acknowledge the implementation of a schooling system to encourage evidentiary conduct. Healthcare professionals need to be responsible for antibiotic use by increasing awareness of the value of the safe use of antibiotics for severe infections, both among healthcare workers and the public. Information workshops and lectures on antibiotic misuse will be held for the general public and will also tackle the Antimicrobial Resistance problem.

Conclusion

In the population of Khyber Pakhtunkhwa Province, the prevalence of antibiotic self-drug use is high. This study disclosed a very important insight relating to information, attitude, and practices relating to antibiotics. As specifically mentioned before, strict regulation of antibiotic sales is extremely important. It will pre-empt excessive antimicrobial drug use. It is important to undertake education and awareness campaigns for the general public and the doctors will warn their patients not to use the prescribed medicines for potential conditions anymore.

Self-medication, although a major problem, is safe when a person is familiar with its dosages, effectiveness, and adverse effects. These respondents are medical and non-medical students at a public institution who should be properly aware and educated about the problems of SMA and who will likely become future leaders in the nation. While the majority of respondents regarded self-medication with antibiotics to be an improper practice, it was revealed that their antibiotic-seeking behavior without a prescription was widespread. Respondent's lack of

awareness about antibiotics and antibiotic resistance, as well as their excess of antibiotics' effectiveness, as well as the availability of antibiotics without a prescription in retail outlets, may all serve as potential motivating factors for self-medication. As a result, mitigating measures such as enforcing current regulations and scheduling medications to restrict their availability to the public will secure consumers from abuse. Additionally, healthcare practitioners and media outlets should educate people about the dangers of using antibiotics without a prescription.

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Table 1: Age, Level of Education, and Summary of Demographic Characteristics.

	N (%)		
		Male	Female
	3,600	2,050 (56.9%)	1,550 (43.1%)
Age (years)			
18-21	1,530	810	720
22-25	1,515	870	645
26-29	314	210	104
>29	241	160	81
Level of Education			
Uneducated	230 (6.3%)		
Intermediate	402 (11.1%)		
Undergraduate	2,149 (59.6%)		
Postgraduate	819 (22.7%)		

Table 2: Self-Medication Behavior (Antibiotic self-medication, behavior, and knowledge)

		Yes	No	Don't Know
1	Have you bought Antibiotics without a Medical prescription?	57.5 %	26.08%	15.06%
2	Have you ever treated yourself (self-medication) with antibiotics?	69.02%	20.01%	10.06%
3	Do you think you can treat common infectious diseases with Antibiotics successfully by yourself?	54.52%	31.25%	4.22%
4	Do you usually stop taking antibiotics when you start feeling better?	56.09%	28.05%	14.06%
5	Do you keep antibiotics at home for emergency needs?	83.86%	13.52%	2.61%
6	Did Doctor inform you how antibiotics should be used?	90.3%	5.83%	3.39%
7	Did you save antibiotics for the next time you get sick?	83.01%	11.03%	5.05%
8	Pharmacy staffs take their time to inform you how antibiotics should be used.	74.08%	11.09%	13.03%

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Table 3: Knowledge of respondents regarding Antibiotics

		Agree	Disagree	Don't Know
1	Different antibiotics are used to cure various diseases.	78%	10.05%	10.07%
2	Antibiotics are effective against bacteria.	72.36%	9.22%	18.41%
3	Antibiotics speed up recovery from most coughs and cold	64.07%	19.09%	16.84%
4	Antibiotics are effective against the virus.	60.03%	16%	23.07%
5	Antibiotics can imbalance the body's flora.	20%	21.03%	58.05%
6	The unnecessary use of antibiotics causes bacterial resistance.	15.19%	8.25%	76.66%
7	Antibiotics can be used to stop the fever.	58.3%	20.9%	20.8%
8	Antibiotics may cause an allergic reaction.	53.25%	10.06%	36.11%
9	Resistance to antibiotics is a worldwide problem.	31.09%	22.04%	46.87%

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