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Antibiotic knowledge and practices of students attending in Medical Institute / Southern Technical University

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ABSTRACT: Antibiotic resistance is now a major a medical and financial burden that affects healthcare globally. Insufficient undergraduate instruction on antibiotic management may be a factor in antibiotic-related clinical malpractice, which could have detrimental effects on patient wellness. The study's objective was to evaluate undergraduate medical students at the Medical Institute in Al-Nasiriyah understanding, beliefs, and behaviors regarding resistant antibiotics. Methodology: A cross-sectional investigation was making in the University of the Medical Institute in Al-Nasiriyah. (133) undergraduate medical students who were chosen at random were given a structured questionnaire. The statistical package for social sciences and SPSS, version 22.0, was used to analyze the data. A Chi-square test was used to examine relationships between the independent and dependent variables. Results: 133 of 188 medical students (71%) had good understanding about the use and resistance to antibiotics, according to the study. Regarding antibiotics and antibiotic resistance, the students' knowledge is good; however, their understanding of antibiotic usage is below average. Knowledge is influenced by a number of variables, such as program, academic level, gender, and awareness of resistance to antibiotics. Based on the results, it is recommended that students' understanding of these topics be enhanced. Conclusions: There are a lot of common misconceptions in some fields, like the usage of antibiotics. Immediately interventions are necessary to enhance students' understanding of antibiotics and resistance in light of the findings. Although they were less practiced, the students' knowledge and attitudes were higher.

Keywords: Antibiotic resistance, knowledge, Bacteria, Health, Drugs, Virus

1. INTRODUCTION

Antibiotic resistance (ABR) is one of the major challenges facing modern medicine globally, specifically in poor the countries [1]. Requires a basic understanding of ABR, as well as caution when using self-medicated antibiotic [2].Pharmaceutical products are actually an integral aspect of the human diet [3],[4]. World Health organization (WHO) came to a decision in May 2015 to address the worldwide risk posed by ABR by raising consciousness of and knowledge about it [5]. Nevertheless, the general public and health care providers have certain misunderstandings about the therapeutic effects of antibiotics [6],[7]. In addition to , the improper and overuse of antibiotics without supervision, as well as the unregulated dispensing and use of antibiotics by regular people and occasionally by healthcare providers, may result in unfavorable outcomes that could endanger the person receiving treatment and hasten the development of resistant microbes towards a majority of proven antibiotics [8], that lead to have made AMR a worldwide medical care emergency, which is made worse by a dissipated new antibiotics production [9]. Therefore, it is important to promote training courses, programs that lead to education appropriate and efficient management to antibiotics for health care providers [10],[11]. Antimicrobial resistance has challenged obstacles to the efficient control and treatment of diseases through some pathogenic organisms. These challenges arise from a combination of variables at the boundary between humans, animals, and the natural world, which may change the genomes of microbes and result in impermeable superbugs across different sectors [12],[13], consist of Pseudomonas aeruginosa, Staphylococcus

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aureus and Escherichia coli [14],[15]. The Antimicrobial Stewardship Program (ASP) is a key tactic in the fight against and mitigation of AMR[16]. The main objectives of ASP are to prevent or delay the emergence of antimicrobial resistance (AMR), enhance the choice of antibiotics, encourage prudent prescribing, shorten hospital stays, stress the importance of finishing treatment with antibiotics, decrease adverse reactions to drugs, and decrease mortality and morbidity [16]. Stressing to students the value of using antibiotics sensibly during their undergraduate studies is very beneficial because it can be challenging to change their perspectives, beliefs, and behaviors once they graduate. However, insufficient training on the use of antibiotics during undergraduate studies may lead to antibiotic-related medical negligence, which could have detrimental effects on patient safety [17].

2. SUBJECTS AND METHOD

A questionnaire-based, cross-sectional survey carried out in October and December of 2022. The study was carried out at Al-Nasiriyah medical institute, southern technical university, Iraq. Only Students of second levels of Faculties of Nursing, Community Health and Medical Lab Science were carried out in this study. There were 188 medical students in the final classes, and for this work, a straightforward random sampling technique was used.

The questionnaire was created with direct questions (18) and Arabic language by the authors (specialist). Informed consent was obtained from each participant before the administration of the questionnaire regarding the objectives of the study.

2.1 STUDY POPULATION AND DATA COLLECTION

Surveys were used to gauge participants' knowledge and attitudes, with (133) out of n=188 returning questionnaires (71% response rate, respectively). A semi-structured, self-administered questionnaire modified from earlier research was used to gather data. In order to assess the questionnaire's clarity, a sample of randomly chosen students from different medical complex faculties completed it. The questionnaires were then validated by lecturers from the department of medical lab science, and any questions that the students found unclear were cleared up.

The questionnaire's first section asked about the students' socio demographic traits, and its second section asked about their understanding of antimicrobial resistance (AMR) and included True/False responses. The collected data were submitted to descriptive statistical analysis (number and percentage) for the frequency of answers.

2.2 DATA MANAGEMENT/ANALYSIS

Pearson Chi-Square test was used to determine if there is a significant association between the frequency of answers and educational level. Probability values (P), less than 0.05 were considered statistically significant while values less than 0.01 were considered highly significant. SPSS (version 20) and Microsoft Excel 2016 were used in data analysis.

3. RESULTS AND FINDINGS

The results of the data analysis are methodically presented in tables in this chapter, and they align with the goals of the research in the following ways:

Table 1. - Students' distribution based on their demographic characteristics

	Groups	Frequency	Percentage
Age	25-30	133	100.0
	Total	133	100.0
Department	Technical Analytical Department	45	33.8
	Community Health Department	45	33.8
	Nursing Department	43	32.3
	Total	133	100.0

This table indicated that all students cooperative in this study fill in the age group between 25-30 years old. Concerning to medical departments distribution that were the most of study sample were distrusted equally between Technical Analytical Department and Community Health department.

Table 2. - A statistical summary of students' knowledge about antibiotic use and resistance

Questions	Responses	Frequency	Percent	M.S	Std. Deviation	Evaluation
1.The inappropriate use of antibiotics could lead to development of resistant bacteria	False	21	15.8	2.62	0.746	High
	I don't Know	9	6.8			
	True	103	77.4			
2. Antibiotic-resistant bacteria could infect me or my family	False	11	8.3	2.81	0.566	High
	I don't Know	3	2.3			
	True	119	89.5			
3. Antibiotic resistance is a significant problem.	False	21	15.8	2.54	0.754	High
	I don't Know	19	14.3			
	True	93	69.9			
4. If taken too often, antibiotics are less likely to work in the future.	False	18	13.5	2.58	0.720	High
	I don't Know	20	15.0			
	True	95	71.4			
5. Using fewer antibiotics will decrease antibiotic resistance	False	47	35.3	2.09	0.892	Moderate
	I don't Know	27	20.3			
	True	59	44.4			
6. Limitations on antibiotics will cause more harm than good	False	49	36.8	1.97	0.843	Moderate
	I don't Know	39	29.3			
	True	45	33.8			
7. Antibiotics can kill bacteria	False	35	26.3	2.44	0.882	High
	I don't Know	5	3.8			
	True	93	69.9			
8. Bacteria that typically reside in the stomach and on the skin can be killed by antibiotics.	False	25	18.8	2.54	0.793	High
	I don't Know	11	8.3			
	True	97	72.9			
9. Antibiotics can kill viruses	False	63	47.4	1.97		Moderate

	I don't Know	11	8.3		0.961	
	True	59	44.4			
	False	29	21.8			
10. Antibiotics work on most coughs and colds	I don't Know	14	10.5	2.46	0.830	High
	True	90	67.7			

Level of evaluation: (1-1.67) = Low ; (1.68-2.33) = Moderate; (2.34-3.00) = High

According to this table, the majority of the study sample had a (High) level of knowledge regarding the use of antibiotics and antibiotic resistance.

Table 3. - Summary data for the overall assessment of students' knowledge regarding the use and resistance to antibiotics

	Scale	Frequency	Percent	Mean	Std. Deviation	Eval.
Overall assessment of students' knowledge regarding the use and resistance to antibiotics	1-10 False	7	4.7	2.71	0.457	High
	11-20 I don't Know	39	29.3			
	21-30 True	94	70.7			
	Total	133	100.0			

This table demonstrates that the study's overall assessment of students' knowledge of antibiotic use and resistance was high.

Table 4. - Distribution and Relationship between Knowledge of antibiotic use and resistance among students and Medical Department at Institute

Antibiotics Resistance and Use / Students Knowledge	Statistics					
	N	Mean ±S.D.	F	d.f	P. value	Sig
Technical Analytical Department	45	2.80±.390	7.607	132	0.001	Sig.
Community Health Department	45	2.51±.772				
Nursing Department	43	2.21±.881				
Total	133	2.51±.745				

No. = Number of frequencies, F = Fisher test, d.f. = degree of freedom, Sig=significance.

This table show there is statistically significance differences in all department of the distribution and relationship between Knowledge of antibiotic use and resistance among student and institutes medical departments, at (p value less than 0.05), when analyzed by Anova test.

4. DISCUSSION

This study looked into the medical lab science, community health, and nursing students' knowledge at Al-Nasiriyah medical institute, southern technical university on the applications of antibiotics and the issue of resistance to them. Most students (71%) have received take antibiotics instructions especially from the doctor or from pharmacy. Previous studies also showed that the doctor was the responsible for health human instruction [18]. This part covers the knowledge level on the various evaluated fields as well as the variables related to the uses. According to the study, students' general knowledge of antibiotics and resistance to them is higher than a median, but their understanding of how to use antibiotics is a poor. However, the study revealed weak role of the media in antibiotics education when

asked groups of students. In another Iraqi study, media was found the main source of information [19]. This reason could be related to the different social environments among Iraqi governorates or explanation could be the lack of many and clear instruction on the proper use of antibiotics and its benefit, In addition to the economic or Ignorance status could be another explanation. Previous research involving university students in Ethiopia and the United Arab Emirates revealed similar results [20],[21]. Regarding knowledge of antibiotics, the study's conclusions were somewhat alarming. For example, the majority of students incorrectly replied that paracetamol is an antibiotic. This discovery is concerning since it may result in the overuse of antibiotics and the improper administration of paracetamol for infections caused by bacteria. The results also showed that most people believed that antibiotics could speed up the healing process for colds and coughs and were useful towards viral illnesses. This outcome is consistent with research findings from earlier studies [22].

The present research, nevertheless, is a little more encouraging compared to the study of Italian medical students, who believed that antibiotics could be used to treat viral infections in 83.2% of cases [22]. The majority of them believed that cough, fever, and common colds could all be treated with antibiotics. Compared to the findings of previous research, the majority of nursing students sampled in Spain reported having a solid understanding that antibiotics cannot be used for the treatment of inflammation, pain, coughs, or colds [23],[24]. Of those who replied effectively to the current study, 71% said that pathogenic bacteria are treated with antibiotics. The current study found that participants had a generally good understanding of antibiotic use and resistance, which was consistent with reports from India [25]. Comparable to this, most participants in Italy (95.2%) knew that antibiotics are effective in managing infections caused by bacteria [22]. A high degree of awareness regarding the efficacy of antibiotics in treating pathogenic bacteria was revealed by another investigation conducted in India [26]. 90% of medical students were informed about the use of antibiotics, according to Indian researchers [27]. The participants may have encountered this subject in pharmacology, medical microbiology, and clinical student practical, which could be the cause of this. The claim that antibiotics cannot treat viral illness was met with a high degree of accurate response in the current study. This is comparable to a study conducted in Saudi Arabia wherein the vast majority of medical students disregarded the fact that antibiotics are an effective means of treating infections caused by viruses [28]. Additionally, according to various investigations, medical students disagree that antibiotics are an effective way to treat viral sickness [29],[30]. Prior research has also demonstrated that medical students possess a strong understanding of antibiotic usage and resistance [31]. The individuals' perspective on antibiotic usage and resistance Antibiotic resistance has been attributed in large part to antibiotic harm, according to numerous other investigators [32]. Furthermore, 76.9% of study participants concurred that education regarding the prudent use of antibiotics is crucial. This is in line with a South African study wherein the majority of medical students expressed a desire for greater instruction regarding the responsible administration of antibiotics [33]. According to other studies, medical students should receive a sufficient education on the responsible use of antibiotics and antibiotic resistance because they will be the ones writing prescriptions later on [34],[35],[36].

Research conducted elsewhere revealed that nursing students possessed a strong understanding of the significance of following the recommended course of antibiotic treatment and not stopping it until the infection's symptoms and indicators had subsided [37]. These data show that antibiotic education needs to be improved for students studying medical lab science, nursing, and community health. An increase in antibiotic-resistant situations may result from improper use of antibiotics caused by not enough knowledge of them. Also, the results showed that female students knew more about antibiotics and antibiotic resistance than male students did, which is in contrast to results from medical students in Nigeria that showed male students knew more about antibiotics than female students [38].

These results revealed the weakness in preventive programs and the necessity of strengthening these programs especially on role of problems of drugs and uses. Health programs and advertisements in addition to medical professionals are good environments to perform these programs. Students, doctor and any person work in medical fields can transmit the antibiotics knowledge to the family and community. In addition to that, one of the major problems in Iraq is the shortage in the Middle Staffs (Doctors, Nurses and Medical assistant), which could explain the serious shortage in educational centers. Proper technique of medication uses practices wasn't evaluated in this study which is one of its limitations. Larger sample size may be necessary to confirm the results of this study.

There are significant knowledge gaps among aspiring doctors, especially when it comes to treating infections with high incidence. This discovery could prove beneficial in creating more efficient antibiotic stewardship education programs for college students.

5. CONCLUSIONS

In spite of previously received instruction about antibiotics uses, the study revealed important gaps in antibiotics practices among especially when used without consulting a specialist doctor. In addition to that, higher educational level may not influence proper medication uses practices. There is an urgent need to accentuate antibiotics educational programs. Target population should be carefully evaluated to create effective educational programs to incorrect uses of antibiotics. These programs should be followed by longitudinal following-up to evaluate the obtained results.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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