e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(2); 316-322

Original Research Article

Knowledge, Attitude and Practice of Paramedical Staff Working in a Medical College and Hospital towards Antibiotic Use and its Resistance: A Cross-Sectional Study

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Received: 29-11-2022 / Revised: 30-12-2022 / Accepted: 30-01-2023
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Conflict of interest: Nil

Abstract

Background: Antibiotic misuse is common and contributes to antibiotic resistance, particularly in less-regulated healthcare systems like India. Antibiotic knowledge is well known to be relatively low among patients and the general public in many countries. Antibiotic misuse is especially noticeable in India, which is one of the largest global consumers of antibiotics for human health.

Objective: To assess the knowledge, attitude, and perceived practices of paramedical staff working in a medical college and tertiary care hospital regarding antibiotic usage and resistance.

Methodology: This is a cross-sectional quantitative questionnaire-based study in a tertiary healthcare medical college and Hospital in eastern India. Total of 341 paramedical staff were provided with a pretested self-administered questionnaire. The survey questions focused on key topics such as antibiotic knowledge, attitude, and perceived antibiotic usage practices.

Result: The majority of participants were under 40 years old and graduates. They understood antibiotic resistance well (81.81 percent) and side effects (91.2 percent). However, there was a widespread misunderstanding about the indications for antibiotic treatment, with only 17.00 percent agreeing that antibiotics play no role against viruses.

The overall attitude was poor, with 65.98 percent expecting antibiotic prescriptions for short-term fever and the common cold. An alarming 92.96 percent of children expected antibiotic treatment for an ear infection. Compared to other paramedical staff, nurses and pharmacists had four times the knowledge about antibiotics. There was no significant relationship between antibiotic prescription patterns and doctor trust.

Conclusion: Most participants knew a lot about antibiotic resistance and its side effects. Still, their attitude and usage practices are poor, and outcome-based education, such as frequent Continuing Medical Educations and awareness campaigns, could effectively bridge the gap between knowledge and practice.

Keywords: Antibiotics, Antibiotics Resistance, Knowledge, Attitude, Practice, Paramedical.

Introduction

Antimicrobials are the most often administered medications in clinical practise. The use of antibiotics is usually unnecessary or improper, though. One of the main factors that has considerably contributed to the issue of antibiotic resistance is the indiscriminate use of antibiotics. [1]. The delivery of healthcare is seriously threatened by the rapid rise in antibiotic resistance. In addition, the rapid expansion of bacteria that are resistant to antibiotics has made it more challenging to treat deadly bacterial infections [2].

The problem is made worse in underdeveloped nations by self-medication without a prescription, sales of over-the-counter antibiotics, insufficient antibiotic regulation, high expenses of medical consultations, and discontent with medical professionals [3,4]. In the entire world, non-prescription purchases of antibiotics account for more than half of all purchases [5]. Despite being a severe problem, antibiotic resistance has received little attention in underdeveloped nations. Due to this, the extent of the issue is mostly unknown, and there aren't many published research that deal with these problems [6].

To prevent antibiotic resistance, we must first evaluate the knowledge, attitudes, and prescribing practises of healthcare professionals. Numerous studies have concentrated on population awareness, attitudes, and practises surrounding the use of antibiotics and resistance, while few studies have focused on health professionals or paramedical staff. Even the few studies that were released looked at how often doctors prescribed antibiotics [7,8]. It is crucial to understand that nurses and other hospital support personnel play a crucial role in limiting the development of resistant bacterial infections and increasing patient and community knowledge of antibiotic resistance. This study's goal was to find out how nurses and other paramedical staff members, like technicians, optometrists, audiologists, lab assistants, pharmacists, and physiotherapists, feel about using antibiotics.

Material and Methods

Study design

Utilizing surveys, this cross-sectional study was carried out. This study was conducted for three months at the SLN Medical College and Hospital in Koraput, Odisha. A total of 341 willing study participants have been recruited. They were mostly paramedical workers such as nurses, technicians, optometrists, audiologists, lab assistants, pharmacists, physiotherapists, and clerks. Every individual whose informed written consent was obtained was included in the study. A self-administered, pretested questionnaire was used to conduct the survey of the participants. The questionnaire has four sections with a total of 25 questions. The responses pertaining to the sociodemographic profile of the study participants were recorded in the first segment. The second component measured their knowledge, the third their attitudes, and the fourth their behaviours in relation to antibiotic usage and resistance. Participants had to select "yes," "no," or "don't know" for each question after the first. A thorough assessment of the body of work that was relevant to our study was used to develop the survey questions. The survey was originally written in English before being translated into Odiya. We employed a survey instrument that had previously been used for other polls [9-12]. The ethics committee provided institutional ethical clearance ahead of the study's launch.

The entire dataset was entered into Microsoft

Excel and analysed using SPSS 22.0. The data were described using frequency and percentages as descriptive statistics, and the data were assessed using odds ratio and Chi-square as inferential statistics. Four main questions were posed to participants: whether or not antibiotics are effective against bacteria, viruses, or both; whether or not antibiotics help patients recover faster from colds; and whether or not antibiotics are beneficial in treating children's ear irritation. The right responses to each question were given a score of 1, while the incorrect ones were given a score of 0. If a participant's average score was greater than or equal to 2, they were considered qualified for the study.

Results

The questionnaire was completed by all 341 participants with a 100% response rate. Males constituted 29.61% (101) of the total study participants, while females made up the remaining 70.38% (240). Among them, 14.02 percent (48) of them denied having received any prior medical training. In addition, 72.72 percent (248) of respondents had at least one child less than the age of 6 years. Almost all our participants (95.88%) were between 20-40 years of age and had education (93.27%) of graduate level and above. The socio-demographic profile of the study participants is summarized in Table 1.

Table 1: Socio-demographic characteristics of the study participants

Characteristic	Number (n= 341)	Percentage (%)
Sex		
Male	101	29.61
Female	240	70.38
Age group		
21-30 years	172	50.43
31-40 years	155	45.45
41-50 years	14	4.1
	341	
Education		
Illiterate	0	0
School and college	23	6.74
Graduation and above	318	93.25
One child in family at least below 6 years	248	72.72
No prior medical training	48	14.07

Table 2 describes the complete list of survey questions used for assessing the knowledge, attitude and practices of the study respondents and the percentage of respondents agreeing with the statements used in the survey questionnaire.

Table 2: Study participants giving correct response to statements

Statement	Number (n=341)	Percentage (%)
Antibiotic- Knowledge, use, side effects and resistance		
Name an antibiotic correctly	301	88.26
Used an antibiotic at least once	329	96.48
Antibiotics work well against bacteria.	159	46.62
Antibiotics have no effect on viruses.	58	17

Colds caused by viruses	301	88.26
Colds caused by bacteria	322	94.42
Frequent antibiotic use can increase bacterial resistance and reduce future effectiveness.	279	81.81
Antibiotic use disrupts the gut flora and leads to diarrhoea.	311	91.2
Attitude towards antibiotic usage		
Respondents whose children require antibiotics more than six times per year	149	43.69
Even a one-day fever necessitates the use of antibiotics.	225	65.98
Children's ear infections always necessitate antibiotic treatment.	317	92.96
Antibiotics speed up recovery from cold	300	87.97
Doctors should always prescribe antibiotics.	293	85.92
I respect the doctor's decision not to prescribe antibiotics.	240	70.38
Doctors always explain how antibiotics should be used in detail.	227	66.56
Practice towards antibiotic usage		
Even if you feel better after half of the treatment, you should finish the course of antibiotics.	310	90.9
Antibiotics that have been used should not be reused at a later date.	284	83.28
Antibiotics should not be purchased directly from pharmacy/chemists	224	65.68

88.26% (301) could name a few antibiotics in terms of general understanding, usage, side effects, and antibiotic resistance. The majority of them (96.48 percent; 329) admitted to using antibiotics at least once throughout their lifetimes. Only 17 percent (58) and 46.62 percent (159), respectively, agreed that antibiotics are used to treat bacterial illnesses while antibiotics are useless in treating viral infections. According to two-thirds of them (88.26 percent (301), colds are caused by viruses, while a staggering 94.42 percent claim that colds are caused by bacteria (322). 91.2 percent (311) of respondents were aware of the most prevalent side effects of antibiotics, and 81.81 percent (279) were aware that continuous use of antibiotics causes resistance and lowers its future effectiveness. 65.98 percent (225) of respondents stated that antibiotics should be provided even for transient fevers, while 92.96 percent (317) said that antibiotics should always be used to treat paediatric ear infections. 43.69 percent (149) of the respondents, or half of the sample, said that their kids had taken antibiotics six times in the year prior.

Despite the fact that 87.97% (300) believed antibiotics speed up the recovery from a cold, 85.92% agreed that a doctor should only give antibiotics, and 70.38% (240) trusted the doctor's judgement to not do so. Only 227 people, or 66.56 percent, were against buying antibiotics over the counter. Contrarily, 83.28 percent (284) said that antibiotics that have been used and are still in the supply shouldn't be used later, and 90.9 percent (310) agreed that a course of antibiotics should never be discontinued midway. Likewise, 65.68 percent (224) expressed satisfaction over the fact that medical professionals usually take the time to thoroughly explain how to utilise antibiotics. In tabular form, factors related to awareness of the efficacy of antibiotics are listed.

Table 3: Factors associated with knowledge of study participants regarding effectiveness of antibiotics

Parameters	Knowledge		OR (95% CI)	Chi square, P value
	Present (61)	Absent (280)		
Medical training				
Yes (Nursing staff)	56	210	4.02 (1.61-10.64)	11.34
No (Technicians, clerks etc.)	5	70		0.0007
At least one child < 6 years age				
Yes	49	91	8.89 (4.69-17.15)	63.49
No	12	189		0.0002
Gender				
Male	22	78	1.41 (0.81-2.44)	1.76
Female	39	202		0.173
Education				
2	10	13	3.99 (1.72-9.16)	14.13
3	51	267		0.0003
Age group				
≤30 years	43	129	2.79 (1.62-4.88)	15.8
>30 years	18	151		0.0002
Doctor prescribing antibiotic				
Trust	61	201	—	28.95
No trust	0	79		0.0002
Doctor not prescribing antibiotic				
Trust	48	166	2.49 (1.36-4.63)	10.11
No trust	13	114		0.002

Those with medical training had 11.34 (CI 1.61-10.64) times more knowledge. The same findings were found among those who are young and have at least one child under 6 years, as they have three (CI 1.62-4.88) and nine (CI 4.69-17.15) times more knowledge than those who do not. There were no significant gender differences in knowledge, and those with more knowledge trusted the physician more whether they prescribed an antibiotic or not.

Discussion

The knowledge, attitudes, and practises of paramedics about the use of antibiotics and antibiotic resistance were usefully revealed by our research. The results of our study unequivocally demonstrate that paramedics have above-average understanding of antibiotic resistance and negative effects. The results were consistent with previous recent research that discovered paramedical students had a solid knowledge base. [9] These results are consistent with the observation that better knowledge is frequently associated with healthier lifestyle choices. Only 17.00% of respondents were aware that antibiotics are useless against viruses, whereas 46.62% were aware that antibiotics are used to treat bacterial illnesses, demonstrating a severe lack of information regarding the indication and effectiveness of antibiotics. Nursing professionals and pharmacists knew four times as much as other paramedics did about the efficacy of antibiotics. Our participants under 30 years old showed a 2.8 times higher grasp of antibiotic usage when compared to

older research participants, suggesting that age is a key factor linked with enhanced knowledge. The findings could be explained by the fact that younger people have more infants and toddlers, which would have led to more doctor visits and more knowledge being gained. Additionally, younger people have easier access to electronic media, and their curricula already include revisions to promote knowledge of antibiotics.

Since just 14% of participants knew that antibiotics are ineffective against viruses, our previously published findings indicate that the common understanding of viral and bacterial illness is similar. More than 60% of participants, according to numerous research, think antibiotics should be provided for viral diseases. [12] Such confusion may lead to unnecessarily high antibiotic consumption rates, escalating the already rising bacterial resistance. This emphasises the critical necessity to incorporate a thorough grasp of antibiotic effectiveness into paramedical personnel training at an early level. The results of the current investigation showed that paramedics have a bad opinion about antibiotic use.

Around 50% of study participants who responded to the survey said they had given antibiotics to their children more than six times in the previous year. Furthermore, 92.96 percent believe that ear infection in children always needs antibiotic prescription, and 66.56 percent responded that they want the treatment with antibiotics even if it is for a one-day fever. Despite their relaxed attitude, our respondents' antibiotic use practices were found to be satisfactory. The majority, 85.92%, always sought medical advice before starting an antibiotic regimen, and the majority, 90%, always finished the entire term of treatment. However, it is disappointing to learn that only 65.68% of respondents agreed that antibiotics should never be bought as over-the-counter medications, despite the fact that doctors take the time to thoroughly explain the dos and don'ts of antibiotic use. The frequency of antibiotic prescriptions and doctor trust did not significantly correlate. These results are in line with those of published studies that have made comparable conclusions [12,13]. This emphasizes the importance of educating both paramedics and students [14]. In such cases, outcome-based education, such as frequent CMEs and awareness campaigns, could effectively bridge the knowledge-to-practice gap. Undergraduate and postgraduate paramedical education strategies should also aim to change behaviour and improve student outcomes and increase knowledge [15]. They must be tailored to the development, capabilities, and experience of the younger generations [12].

The main problem of antibiotic use and resistance among paramedics, an area in which little prior research has been done, is addressed in the study, which is one of its strong points. Due to the close relationship between paramedics and doctors and the widespread belief that they would have a better understanding of antibiotics, this community has remained unaffected. Our research has some drawbacks. In order to include individuals from only one medical institution, we adopted a convenience sample strategy, which restricts the potential to extrapolate results. Second, as is the case with most surveys, it's likely that respondents gave responses that were more in line with societal norms than with their real beliefs or behaviours.

Conclusion

While paramedics understand antibiotic resistance and side effects well, our study indicated that their attitudes and practises on antibiotic use are typically inconsistent and subpar. If we are to successfully address the growing issue of antibiotic resistance, these

divergent points of view present difficulties. According to this study, we should improve awareness of antibiotic treatment and create creative strategies to bring attention to antimicrobial resistance deterrent campaigns in order to avoid the emergence of antibiotic resistance.

Acknowledgements

We would like to express our heartfelt thanks to the study participants who graciously accepted to participate and gave theirvaluable time to the study.

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