

A Cross-Sectional Survey: Knowledge, Attitude & Belief about Antibiotic Use & Its Prevention among Nurses of Tertiary Cardiac CareMaradia M¹, Gajjar S², Patel D³, Christian A⁴¹Assistant Professor, Department of Microbiology, U.N. Mehta Institute of Cardiology and Research Center; Affiliated to B. J. Medical College, Asarwa, Ahmedabad²Clinical Microbiologist, U.N. Mehta Institute of Cardiology and Research Center; Affiliated to B. J. Medical College, Asarwa, Ahmedabad³Infection Control Nurse, U.N. Mehta Institute of Cardiology and Research Center; Affiliated to B. J. Medical College, Asarwa, Ahmedabad⁴Infection Control Nurse, U.N. Mehta Institute of Cardiology and Research Center; Affiliated to B. J. Medical College, Asarwa, Ahmedabad

Received: 25-10-2023 / Revised: 23-11-2023 / Accepted: 26-12-2023

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Conflict of interest: Nil

Abstract:**Introduction:** Nurses have an important role to care for hospitalized patients. They have a crucial role in preventing the emergence and spread antibiotic-resistant of microorganisms through infection control programmes and antibiotic stewardship. This requires correct knowledge and attitudes towards antibiotic use and their resistance.**Objectives:** This study was carried out to identify the level of knowledge and attitude on antibiotic use and antibiotic resistance among staff nurses of tertiary care hospitals on the occasion of Antimicrobial awareness week 2022.**Methods:** This cross-sectional survey was conducted in a tertiary cardiac care hospital in Ahmedabad, Gujarat, India on the occasion of Antimicrobial awareness week in November 2022. The survey was conducted for 103 nursing staff using a Self-structured questionnaire.**Results:** While assessing the Knowledge 19.43% had good and 63.10% of nursing staff had moderate knowledge, and 17.47% had Poor knowledge. Less than 30% knew that antibiotics were only used for bacterial infection, not active against viruses. In our study, the majority of staff nurses 78.64% had fair attitudes regarding antibiotics use and their prevention of resistance. Overall, our study found moderate knowledge & attitudes regarding antibiotics and their resistance among the nursing staff.**Conclusion:** Nurses have multiple roles in medication management. Nurses should be active in antibiotic stewardship that ensures proper management of antibiotics to minimize antibiotic resistance.**Keywords:** Nurses, Antibiotics, Awareness.

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Introduction

Antibiotic resistance is a major health challenge with global ramifications. While the first instances of antibiotic resistance were observed within hospitals during the 1950s, the widespread and inappropriate administration of antibiotics in the following years played a pivotal role in facilitating the development of multi-drug resistant bacteria. Consequently, this has led to escalated costs and, in certain scenarios, rendered the treatment of numerous infections more financially burdensome or even unachievable [1]. In terms of absolute quantity, India stands as the largest consumer of antibiotics worldwide [2]. Antibiotic resistance is one of the major public health threats faced globally. In India, from infections with antibiotic-

resistant bacteria each year. Multiple factors contribute to the improper use or excessive use of antibiotics, stemming from various causes such as inadequate comprehension, confusion, and insufficient awareness concerning antibiotics, their utilization, as well as the emergence and dissemination of antibiotic resistance. Nurses play a crucial role in combating antimicrobial resistance. They play crucial roles in antibiotic stewardship and infection control, two main preventive measures of antibiotic resistance [3,4]. They are one of the main sources of health education for patients and community [5]. Knowledge and necessary attitudes for this role should be present in nurses. Therefore, identifying the level of

knowledge and their belief among nursing students, and the gaps will be identified so we can strengthen nursing training programmes. In relation to antibiotics, nurses are recommended to be active in antibiotic treatment that ensures proper management of antibiotics to minimize antibiotic resistance. Some of the roles of nurses include administering antibiotics, monitoring their effectiveness and educating the patient [6]. Researchers have identified gaps in the knowledge and attitude-belief of staff nurses regarding antibiotics. In which 350 nurses participated, that study showed nurses themselves are not fully aware of the basics of antibiotics. Antibiotic resistance and the methods to be employed in its prevention [7].

100 nursing professionals from various districts of Chhattisgarh state participated in the study, in which a knowledge score found 27(27%) had Adequate knowledge and a Favourable attitude found in 38(38%) staff [8]. In which 225 nurses participated [9]. Which showed that most participants had adequate knowledge, a positive attitude and good practices towards AMR? Significant differences in knowledge, attitudes and practices were observed between pharmacy personnel and nurses in AMR, Compared with nurses, pharmacy personnel had better knowledge of the spread of resistant bacteria from one person to another ($P = 0.001$) and the use of antibiotics in livestock as a contributing factor [9]. In research conducted by Asante et al., 2017, in which 379 prescribers participated, with the majority of them being nurses (50%), the researchers noted gaps in the knowledge and perception of antibiotic prescriptions among prescribers [7].

Aims & Objective

This study assesses the knowledge, attitude and practice of Antibiotic use and resistance among nurses of tertiary care cardiac hospital

This is a baseline study, which aims to: (i) assess the knowledge, attitudes and belief of staff nurses concerning antibiotics, antibiotic use and antibiotic resistance; (ii) provide a baseline dataset for designing and evaluating future policy, communication and educational interventions

Methods:

Duration & type of study: This cross-sectional survey was conducted in a tertiary cardiac care hospital in Ahmedabad, Gujarat, India on the occasion of antimicrobial awareness week in November 2022. This is a pilot study. The survey was conducted for 103 nursing staff.

Sampling Methods: Self-structured questionnaires were made for data collection, after a review of the literature. The questionnaire contains three parts, initially including demographic information

regarding staff, second part having questions regarding nurses' staff knowledge, attitude about antibiotic facts, their resistance, and prevention.

Sample size calculation: Sample size was calculated through online Rao soft software.

In this study, nurses were provided with the study information.

Inclusion Criteria: During the week of antibiotic awareness, we went to different wards in the hospital. The nurses were then invited to take part and data was collected using the structured questionnaire. Hard copies of the questionnaire were distributed to all staff nurses; participating nurses were asked to put their completed questionnaires in the nursing station tray. Confidentiality was maintained throughout the study.

Exclusion Criteria: Nurses who did not want to participate were excluded from the evaluation.

Data collection procedure & Scoring system

All questions contained two different answers. They have one right answer. Every correct answer was given a score of 1, while a wrong response was given a score of 0. A score of out of 10 (i.e., % correct answers) was used as the cut-off point to determine the level of knowledge; a score >8 was labelled 'good knowledge'.

The last part contains the attitude of nurses and staff towards the prevention of resistance. The questions were rated on a 5-point scale 1 for true belief and 0 for false. A score of 2.5 (50%) was labelled 'poor attitude', >3 to 4- as 'moderate', and ≥ 4 (80%) as 'good attitude'.

Ethical Consideration & permission: Institutional ethics committee approval has been taken before starting this study.

Statistical analysis: The data were entered into an Excel sheet coded, and exported to Statistical Software IBM (SPSS) Version 21 for analysis. All statistics were recorded for the demographic variables.

The Chi-square test was used to check the association between knowledge and demographic variables, as also between attitude and demographic variables. All inferences were selected at a 95% confidence interval with a level of significance of 0.05.

Results

Characteristics of staff

Almost all the participants were (98.06%) female. The mean age of the nursing staff was 29 years; the nursing experience more than 10 years 14 staffs(13.6%), 6 to 10 years 18 staffs(17.5%), 2 to 5

years 13 (12.6%) ≤ 1 year 58 staffs (56.3%). On demarcation for the professional designation of the staff nurse, 100 (97%) of them worked as staff nurses of which 58 (56.3%) worked as Junior staff

nurses, and 3 (3%) out of 103 worked as in charge. Staff working in ICU were 33 (32%) and working in wards 71 (68%) out of 103. [Table.1]

Table 1: Characteristics of staff-Demographic variables

Variables		
Gender	N.	Percentage
Female	101	98.06%
Male	2	1.94%
Designation		
Ju. Staff Nurse	58	56.3%
Staff Nurse	42	41%
Incharge	3	3%
Year of experience		
<1 year	58	56.3%
2 to 5 years	13	12.6%
6 to 10 years	18	17.5%
>10 years	14	13.6%
Area of work		
ICU setting	33	32%
Ward	71	68%

Nurses' Knowledge about Antibiotics:-Facts about Antibiotics, their Resistance, and Prevention of Antibiotic Resistance The truth about antibiotics, effective hand-washing is the most important practice to prevent infection of germs and Antibiotics has no side effects this question rated

the highest, with a score of 85%. Inappropriate use of antibiotics can lead to antibiotic resistance, 83 (81%) The question "An antibiotic is active against viruses and fungi." Have the lowest score of 19%.

Table 2: Nurses' Knowledge about Antibiotics:-Facts about Antibiotics, its Resistance, and Prevention of Antibiotic resistance

Sr. No	Knowledge	Correct Answer	The answer was given by the staff	N.	Percentage
1	An antibiotic is active against viruses and fungi.	False	False	20	(19%)
			True	83	(81%)
2	Antibiotics have no side effects	False	False	83	(81%)
			True	18	(18%)
3	Any antibiotic is active against any type of bacteria	False	False	44	(43%)
			True	59	(57%)
4	Antibiotics are indicated for the common cold	False	False	57	(55%)
			True	46	(45%)
5	Antibiotics are indicated for all types of diarrhoea	False	False	65	(63%)
			True	38	(37%)
6	Inappropriate use of antibiotics can lead to antibiotic resistance	True	True	83	(81%)
			False	20	(19%)
7	Genes responsible for resistance can spread from one bacteria to another	True	True	64	(62%)
			False	39	(38%)
8	Strengthening infection control measures can reduce the spread of antibiotic resistance	True	True	74	(72%)
			False	29	(28%)
9	Antibiotics can kill good bacteria in our bodies.	True	True	78	(76%)
			False	25	(24%)
10	Antibiotic resistance is only a problem for people who take antibiotics regularly.	False	False	60	(58%)
			True	43	(42%)

Nurses’ Attitude Towards antibiotic and its Used, Prevention of Antibiotic Resistance:

Regarding the attitude of nurses towards antibiotic self-use 18(17%), reported a score of for the use of antibiotics in symptoms of the common cold 45(46%) and A good score was obtained from staff believe that “Hand washing can prevent the spread

of resistant bacteria” 88(85%). A high score was observed in the use of antibiotics without a prescription as a result of previous experience in78 (76%), and advice on antibiotics to relatives and friends 39%, The highest score with proper time and duration is important to giving antibiotics have a score of 82% [Table -3].

Table 3: Nurses’ Attitude Towards antibiotic and its Used, Prevention of Antibiotic Resistance

Attitude					
11	Proper time and duration are important to given antibiotics	True	True	84	(82%)
			False	19	(18%)
12	Hand washing can prevent the spread of resistant bacteria	True	True	88	(85%)
			False	15	(15%)
13	Do you always consult a physician before taking antibiotics?	Yes	Yes	53	(51%)
			No	50	(49%)
14	Do you advise antibiotics to your relatives and friends?	No	No	63	(61%)
			Yes	40	(39%)
15	Do you use antibiotics without a prescription as a result of previous experience?	No	No	25	(24%)
			Yes	78	(76%)

Table 4: Nurses' Percentage of Knowledge

	Category	N	(%)
Percentage on Knowledge	80–100	20	19.43
	50-<80	65	63.10
	<50	18	17.47

Table -5: Nurses' Percentage of Attitude

	Category	N	(%)
Percentage on Attitude	80–100	81	78.64
	50-<80	6	15.53
	<50	16	5.83

Nurses’ Overall Knowledge and Attitude Regarding Antibiotics [Table 4 & 5].

The all-over Knowledge about antibiotics in the nurses was observed to be 19.43 % with good knowledge, 63.10 % with moderate knowledge and 17.47 % with staff’s poor knowledge.

Knowledge about antibiotic resistance (Question 5,6,10)was seen to be 30.09 % with good

knowledge,42.72 % with moderate knowledge and 27.18% with staff with poor knowledge.

Knowledge of prevention of antibiotic resistance was seen to be 74% (72) with good knowledge, 30(31) % with poor knowledge.

The overall score on attitude showed 78.64 % with good attitude and 15.53 % with poor attitude 5.83 [Table 5].

Table 6: Correlation of Knowledge with the Attitude

		Attitude * Knowledge Cross tabulation			Total	Result
		Knowledge				
		<50	50-<80	80-100		
Attitude	<50	7	0	9	16	P=<0.001 R= 0.961
	50-<80	2	4	0	6	
	80-100	9	61	11	81	
Total		18	65	20	103	

A significant association (p < 0.001) was seen between the nurse's knowledge & their attitude toward AR prevention. More experienced nurses had a higher score in their overall knowledge of AR than their counterparts with less experience.

Table 7: Correlation of Attitude with the Demographic Characteristic

Attitude * Demographic Characteristic				
	<50	50-<80	80-100	P value
Less than 1 year of experience	5	38	13	<0.001
More than 1 year of experience	1	19	11	

A significant association ($p < 0.001$) was seen between the nurse's attitude with the Demographic characteristic.

Discussion

Infection prevention through prudent use of antibiotics is everyone's responsibility; nursing plays a crucial role in antibiotic resistance crisis. Knowledge and attitude have an impact on their practices. There are several findings in our study.

While assessing the Knowledge 19.43% had well and 63.10% of the nursing staff had moderate knowledge, and 17.47% had Poor knowledge. Less than 30 % knew that antibiotics were only used for bacterial infection, not active against viruses. More than half of nurses had moderate knowledge of the basics of antibiotics. Similar findings were also observed in the study [7]. Our finding contradicts that of the study in which nurses showed good knowledge of antibiotics [10].

In our study, the majority of staff nurses 78.64 % had a fair attitude regarding antibiotics use and their prevention of resistance; similar findings were also observed in the study (. Lalithabai, Diana et al, 2022)[7]. A high score was observed in the use of antibiotics without a prescription as a result of previous experience in 76%. In our study antibiotics in symptoms of the common cold 46%. Another study observed that trainee nurses reported that the intake of antibiotics helps prevent colds from worsening and demonstrates a fair attitude (Jayaweerasingham et al., 2019)[10]. In our study, 15.53% had a Moderate attitude and 5.83% of the nursing staff had an Unfavourable attitude. A correlation was found between Knowledge & Attitude. Correlation is significant at the <0.001 level. Also found Correlation of Attitude with the Demographic characteristic is significant at the <0.001 level.

Our study reported a positive attitude towards aspects of prevention; the overall attitude of participants towards the prevention of Antibiotic resistance was fair and good. Similar to finding findings of (Kistler et al. 2017), who reported evidence-based positive attitudes of nurses [11].

Overall, our study found moderate knowledge & attitudes regarding antibiotics and their resistance among the nursing staff. Findings are similar to what was reported in Nepal, where HCWs had moderate knowledge, attitudes and practices concerning AMR[12]. There is growing recognition of the importance of engaging nurses in hospital stewardship efforts [13-16].

Nurses can play an especially important role in Optimizing testing, or diagnostic stewardship, as

proper sample collection. Assuring that cultures are performed correctly before starting antibiotics with proper asepsis. Prompting discussions of antibiotic treatment, indication, and duration. An educational interventional strategy has been implemented to be effective in improving knowledge, attitudes and practices regarding antibiotics and their resistance. This may increase the awareness of nursing staff concerning AMR, which can in turn improve their knowledge, attitudes and that's how improve practices.

Conclusion

Nurses have multiple roles in medication management. In relation to antibiotics, nurses are recommended to be active in antibiotic stewardship that ensures proper management of antibiotics to minimize antibiotic resistance. Some of the roles of nurses include administering antibiotics, monitoring their effectiveness and educating the patient. This study highlights the importance of interventions regarding antibiotics among staff nurses. And help nursing staffs improve their awareness of antibiotic resistance and create a favourable attitude towards its prevention.

Contribution of Authors:

MM: Concept, Design, Definition of intellectual content, Literature search, data search, statistical analysis, GS: concept, Definition of intellectual content, Literature search, PD, CA: data collection

Research contribution

This study adds to existing knowledge; might give sources of information and integrate knowledge from staff nurses to provide a comprehensive understanding of a AMR (Antimicrobial Resistance) issue.

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