

## Knowledge, attitude and practice analysis of Antibiotics use and misuse in tertiary care rural hospital patients

### ABSTRACT:

**INTRODUCTION:** In last decades, the increase in bacterial resistance to against all major antibiotics is a growing worldwide problem and is as significant threat to global public health in the 21 century.

**OBJECTIVES:** To assess the knowledge, attitude and practice of antibiotics use and misuse among patients of tertiary care rural hospital.

**METHODS:** this is cross-sectional analysis study was conducted at tertiary care teaching rural hospital in India between December 2020 to April 2021. A self-administrated questionnaire was distributed to the patients in outpatient departments in hospital. The questionnaire consisted of 3 parts, first part consist of demographic variables, second and third part regarding knowledge, attitude and practice of patients towards antibiotic use and misuse. SPSS 21 was used for data analysis.

**Results:** Out of the 110 participants, 56(51.5%) were males and 54(48.5%) were females. 55(50%) patients gets antibiotics from friends, relative and pharmacist without medical doctor checkup. 38(35%) patients start antibiotics as preventive medication for any infection, 73 (66%) patients stopped medicine early if they feels better, 52(47%) patient expect antibiotics from doctor for common cold. 42% patient obtained antibiotics without valid prescription from relatives, pharmacist or self prescription. In knowledge domain while majority of respondent aware that antibiotics is hazardous during pregnancy and lactation, can leads to severe allergic reactions. But very few respondent know about resistance can transfer from animal to human and human to human, also very few respondent know about antibiotics can alter human body bacterial flora.

**Conclusion:** There is lack of knowledge regarding antibiotics use and resistance among general population. Strict strategies need to employ like antibiotics prescription audit, antibiotics dispensing monitoring, effective public health education, and promoting health worker and patient communication.

**Keywords:** Antibiotics, Misuse, antibiotic resistance, health education, communication

### Introduction:

In last decades, the increase in bacterial resistance to against all major antibiotics is a growing worldwide problem and is as significant threat to global public health in the 21 century [1]. This spread of resistance directly affect not only therapeutic effectiveness of drugs but also increase in treatment failure episodes and costs and mortality rates among patients. [2]. Improper and indiscriminate use of antibiotics are important reasons for antibiotic resistance in our country. [3–5]. Misuse of antibiotics occurs due to many reasons like physicians knowledge and experience, diagnostic uncertainty, while general public knowledge, practice, beliefs and attitudes towards antibiotic use, self-administration of antibiotics, patient's expectations from doctors, and patients experience with antibiotics, insufficient patient education by physicians, poor healthcare worker and patients communication are

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important key factors which directly influence antibiotics use and misuses [6–8]. There is a common preoccupation among common public that the use of antibiotics can help in early recovery and sometimes prevention of further development of illness. There is a major gap in understanding about antibiotics use among general population, also very few studies in Indian rural population regarding antibiotics utilization(9,10) are available, hence current study was planned to assess knowledge, attitudes and practice regarding antibiotics misuse in rural population.

### **Materials and Methods:**

**Study design and population:** This is cross-sectional analysis study was conducted at tertiary care rural hospital in India, between December 2020 to April 2021. The participant patients have been suffering from various illness and regularly attending the department of Medicine, ENT, Ophthalmology and General surgery. Patients aged 18 years or above were included in study. Well-structured questionnaires were prepared in English and official regional language Marathi. The questionnaires mostly based on the questions taken from various previous studies, which were edited in context with the objectives of the study [24, 25,26]. A literature review of past similar studies of antibiotics misuse was done to identify potential domains for the study instrument and changes made to suit the local population. A pilot study was also conducted to test the validity of the questionnaire for content, readability, design and comprehension on 20 local peoples and necessary modifications were made so that the questionnaire was simple for understanding and answering, still gave accurate data.

The final version of the questionnaire, consists of 24 questions, divided into four parts. The first part was about demographic variables of local populations. The second part consist of questions regarding knowledge and belief of participant regarding antibiotic use and antibiotic resistance with Yes, No and don't know options. Third part is regarding the attitude of respondent towards antibiotics use consist of 5 statements with yes – no options and the fourth part is comprised of 4 multiple choice questions with suitable options.

A written consent was taken from all respondent before participation in study, Participant confidentiality was assured by assigning each respondent a unique a code number for the purpose of analysis only. No specific incentives or rewards were given to any participants. Study was approved by the institutional review committee.

Data analysis was done using SPSS 21. The prevalence of antibiotics use, misuse and its awareness were determined by comparing outcome measures. Numerical variables were reported as percentage. [if possible, then please do provide the details of antibiotics (along with Brand names), which are in the reach of general population. This would help authors to authenticate their research validity in terms of having the information of most utilized antibiotics without prescription.]

**Results-**Of the 130questionnaires distributed, 110 participant (95.24%) completed questionnaires and were included in study, while the remaining 20 (4.76%) were excluded due to incomplete, invalid filling or double answers. Among 110 participants, 56 (51%) were males and 54 (49%) were females.

Respondents were compared according to their demographic parameters: age, gender, marital status, educational level, antibiotics usage. Among the respondents,21(19%) were in the age group of 18-35, 46(42%) were in 35-50years age group and 26(24%)were in 50 to 65 year age group, while

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**Comment [AK50]:** sometimes this practice prevent the further development of illness

**Comment [AK51]:** Only a few studies have been available regarding the lack of understanding using antibiotics in the rural population of India [9,10].

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17(15%) are in more than 65 year age group. 83(75%) were married, 75(68%) were having education more than high school.

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**Table 1 - Demographic characteristics of respondent.**

Characteristics		N	%
Gender	Male	56	51%
	Female	54	49%
Age in years	18-35	21	19%
	35-50	46	42%
	50-65	26	24%
	>65	17	15%
Education status	Uneducated	12	11%
	Less than high school	23	21%
	High school	39	35%
	Graduation	22	20%
	Postgraduation	14	13%
Marital status	Married	83	75%
	Non married	27	25%

**Table 2 - Knowledge of respondents regarding antibiotics resistance and safety.**

Sr no	Items	N	%
1	Respondents aware of the meaning of antibiotic resistance	44	40%
2	Awareness regarding reasons for antibiotic resistance		
	A) Using antibiotics when it is not needed	22	20%
	B) Not completing the full course of Antibiotics	14	13%
	C) I don't know	74	67%
3	Antibiotics are safe during pregnancy	Y	5 5%
		N	88 80%
		DK	17 15%
4	Antibiotics might develop allergy leading to death	Y	74 67%

		N	6	5%
		DK	30	27%
5	Are antibiotics are safe during breast feeding	Y	2	2%
		N	88	80%
		DK	20	18%
6	Excessive animal use of antibiotics can reduced its effect in human being	Y	23	21%
		N	30	27%
		DK	57	52%
7	You stopped antibiotic course prematurely if symptoms are improving	Y	28	25%
		N	36	33%
		DK	46	42%
8	Antibiotics resistance can spread from humans to humans	Y	12	11%
		N	14	13%
		DK	84	76%
9	Antibiotics resistance can spread from animals to humans.	Y	6	5%
		N	14	13%
		DK	90	82%
10	Antibiotics can negatively alter our antibiotics flora	Y	16	15%
		N	12	11%
		DK	82	75%

**Comment [AK61]:** Delete 'are'

**Comment [AK62]:** Rephrase this sentence as:  
Excessive use of antibiotics in domestic animals can reduce their effects in humans

**Comment [AK63]:** Rephrase it as:  
Termination of the antibiotic course before completion if symptoms are improving

**Comment [AK64]:** the commensals/ body microflora

Y-YES, N- NO, DK- DON'T KNOW

Table 3–Attitude domain questions towards antibiotics use among respondents.

Sr no	ATTITUDE ITEMS	N	%
1	Keeping antibiotics at home as an emergency	48	44%
2	Taking antibiotics as preventive treatment before any symptoms	38	35%
3	Procured antibiotics from relatives or friends with medical consultation	55	50%
4	Premature stopping antibiotics full course when feeling better	73	66%
5	Expect antibiotics from physician for common cold and every fever illness.	52	47%
6	Forcing doctor to prescribe antibiotics if not prescribed	15	14%

**Comment [AK65]:** Add:  
developing any symptom

Table 4 – Practice domain question towards antibiotics use among respondents

SR NO	PRACTICE CHARACTERISTICS	N	%
1	Source of antibiotics		
	Doctors' prescription	64	58%
	Pharmacist	20	18%
	Relatives	12	11%
2	Self-prescription	14	13%
	<i>Reasons for use of antibiotics</i>		
	Fever	44	40%
	Cold	12	11%
	Cough	16	15%
	Sore throat	25	23%
	Toothache	37	34%
	Pain in any part of the body	31	28%
Generally tired	12	11%	
3	Others	10	9%
	<i>Reason for Stopping antibiotics</i>		
4	After finishing the antibiotics course	40	36%
	When patient feel better	66	60%
4	I fully trust my doctor if he <b>not</b> prescribe me any antibiotics	55	50%

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From the assessment of knowledge domain it was found that only 44 % of respondents were aware about of antibiotic resistance, while 68% were not know the reasons for antibiotic resistance, and 22% respondents thing about antibiotic resistance due to improper use and 14% knew that prior stopping antibiotic could leads to antibiotic resistance. 88% were know about antibiotics are risky while pregnancy similarly 88% agree that antibiotic are not safe during breast feeding, 74% respondents were agreed that antibiotics could cause allergic reactions. 57% respondents were unaware about antibiotics use in animals can cause human antibiotic resistance, in fact 30% denied that animal antibiotic use leads to human antibiotic resistance. Only 36% agreed that one should not stopped taking antibiotics once patients start feeling better, while 28% respondents disagreed to it , while 46 % respondents were not know relation between full course of antibiotics and antibiotics resistance. While only 12% respondents were aware that resistance can spread from human to human, and only 6% respondents aware that resistance can spread from animal to humans. However, 16% respondents aware about the fact that antibiotics can cause negative effects on the body's own bacterial flora.

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Comment [AK69]: 88% women respondents were found to be aware of the risky course of antibiotics during pregnancy and even not safer during breast feeding,

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While analyzing attitude domain of questionnaire it was found that, 44% peoples are keeping antibiotics at home for any emergency use. While 35% respondents takes antibiotics as preventive treatment before any start of any symptoms, 50% respondent procured antibiotics from friends and relatives without prior consultation with medical doctor. While 66% patient stopped taking antibiotics before completing the course of treatment, 47% respondents expect antibiotics should be prescribed by doctor for common cold symptoms and for every fever illness and 14% peoples force doctor to prescribe antibiotics if not prescribed.

68% respondent use antibiotics only after doctors prescription while 18% respondents use antibiotics on pharmacist advise, 11% on relatives advise and 13% on self - prescription. 40% people use antibiotics for fever, while 28% uses antibiotics for pain in any part of body and 11% use if they feel tired, 34% use for toothache like reason. 38% respondents stopped using antibiotics if they feel better, while 68% patient completed full course, 50% respondents trust doctor if he doesn't prescribe antibiotics.

### Discussion

According to WHO, Antibiotic resistance is a one of the top 10 global public health problem humanity is facing [1]. Antibiotics resistance causing multiple problem any country. In addition to increase in mortality and morbidity, prolonged hospital stay, rise in demand of more expensive antibiotics and financial burden on individuals it causes significantly increase in financial burden on economy. [11,12] Prevalence of antibiotic resistance become major health problem in world specially in developing countries like India. [13]. It is not difficult in India to obtain any antibiotic without prescription over the counter; hence problems of antibiotic resistance increasing day by day. Major reasons for antibiotic resistance are misuse of antibiotics like indiscriminate and inadequate use of antibiotics [14], misuse of antibiotics in animals etc. [15]. Resistance to ABs has been linked to levels of consumption [16,17] with evidence of a cause effect relationship [18]. Our study is one of few attempts in literature to analyses the knowledge, beliefs, attitude and practice of antibiotics use by general public of Indian rural area.

On positive note, we found that majority of population are agree that antibiotics are hazardous for pregnancy and breastfeeding, also majority of population knows antibiotics can cause severe allergic reactions, which is comparable with other similar studies [19]. While as much as about 40 % population aware of term antibiotic resistance considering rural area which is interesting for us. Also majority of population are (58%) are still using antibiotic only after medical Doctors advice. This finding may be attributed to increase in educational level among population.

But still some major misbelief about antibiotic use and resistance are present among general population which leads to misuse of antibiotics. Around 47% population expect to take antibiotics for common cold, this is because there is lack of understanding that common cold is caused by viruses and not by bacteria and antibiotic are used against only for bacterial diseases. From this study nearly 40% population still believe that keeping antibiotics for emergency use is a good habit, while 50% population think that it is good to procured antibiotics from friends, relatives and friends and pharmacist without any proper medical consultation and doctor's prescription. Various past studies have confirmed that using leftover medications results in poor patients compliance with antibiotics therapy [20] and this may result in increasing the in antibiotics resistance. [20].

**Comment [AK76]:** People keep

**Comment [AK77]:** take

**Comment [AK78]:** the

**Comment [AK79]:** 28%, 11%, 34% use antibiotics for body aches, fatigue and toothache respectively.

**Comment [AK80]:** 66%

**Comment [AK81]:** ?

**Comment [AK82]:** Delete 'a'

**Comment [AK83]:** Rephrase this sentence as: Antibiotic resistance can cause multiple problems including prolonged hospitalization of serious patients, results in rising the demand for more expensive antibiotics, hence increasing the financial burden.

**Comment [AK84]:** Antibiotic resistance has become a major health problem across the world especially in the developing countries like India.

**Comment [AK85]:** in this regional area

**Comment [AK86]:** on the pharmacy counter

**Comment [AK87]:** could be one of the

**Comment [AK88]:** Therefore, it results in indiscriminate and inadequate use of antibiotics in humans and animals as well [14,15]. Undoubtedly, it is directly related to the consumption described by other authors too [16,17,18]. There are limited number of publications are available in the literature, therefore, we aimed to highlight the effects of knowledge, beliefs, attitude and practice of antibiotics use in rural areas of our region.

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**Comment [AK90]:** Delete 'and'  
Put ' comma'

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Add: and

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**Comment [AK95]:** Sometimes viral infection during common cold, could lead to the secondary bacterial infections and opportunistic fungal infections especially in immunocompromised patients.

How would you justify the text written in the discussion?

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About 25% respondents have disagreed for need to complete full course of antibiotics and 66% respondents are stopped taking antibiotics if they feel better. It's very important to complete full course on antibiotics to restrict antibiotics resistance, according to the WHO, when a patient stops antibiotics course prematurely it results in promotes growth of natural resistant strains and therefore it is advisable for patients to always complete full course of antibiotics prescribed to them by a certified health professional [21]. Furthermore, patients need to educate regarding antibiotics resistance as 72% and 82% unaware about fact that antibiotics resistance can spread from person to person and animal to person, respectively. Also, about 75% respondents are not aware that antibiotics can negatively alter our own natural bacterial flora. This finding are correlates with various past studies [19,24,25,26]

Subsequently, the general public needs to be educated on the fact that, the antibiotics efficacy will be preserved only when they are used only as per doctor's advise guidelines and when the full course is completed [20,21]. Patients and healthcare workers communication can play important role to minimize antibiotics resistance. Healthcare worker can convey appropriate usage of antibiotics to general public through effective communication. This has proved in various studies also [22,-25]. But in same study it is noted that healthcare workers and doctors not give enough time to communicate how to use antibiotics, this should be changed [26-28]. A number of related studies were reported [29-33]. Some of the key studies on antibiotics resistance and related issues were reviewed [34-38]. On contradictory to other studies [26-28], in our study level of education and misuse of antibiotics not relate each other significantly, as even respondent with higher education have deficit of basic antibiotics usage knowledge.

### Conclusion :

Considering rapid growth of antibiotic resistance in India, and the related gross effects due to antibiotics resistance, the current study demonstrated important lacunae regarding antibiotic use in general public. There is lack knowledge and understanding regarding the safe use and consumption of antibiotics. There is need to established effective multifaceted intervention to improve appropriate use of antibiotics, which should include following: 1) need To audit antibiotic prescription from healthcare facility. 2) Effective public health education program using all media 3) Strategies need to employ for promoting effective communication between healthcare workers specifically pharmacist, and doctors, and with general public regarding the safe and appropriate antibiotics usage. 4) Need monitoring sources antibiotics through enforcing strict regulations. Need to enforce the strict regulations on the sales and supply of antibiotics and to monitor all the sources from which these are obtained.

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Comment [AK98]: Delete 'for need'

Comment [AK99]: ??

If we talk of the shorter treatment with antibiotics makes sense. Here the exposure of bacteria/ pathogen to antibiotics for shorter time, could help eliminate the problem of microbial resistance to antimicrobials !!

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Comment [AK101]: Reference 21 doesn't fit with the text.

It can be replaced with the following reference: Anti microbial resistance: Does stopping course of antibiotics early lead to antibiotic resistance

<https://www.who.int/news-room/questions-and-answers/item/antimicrobial-resistance-does-stopping-a-course-of-antibiotics-early-lead-to-antibiotic-resistance>

Comment [AK102]: ? Check again

Comment [AK103]: ? Check again

Comment [AK104]: ? Check again

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Comment [AK113]: [https://www.who.int/drugresistance/WHO\\_Global\\_Strategy\\_English.pdf](https://www.who.int/drugresistance/WHO_Global_Strategy_English.pdf)

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