

Original Research Article

## **Knowledge, Attitude and Practice of antibiotics usage among Health care personnel in a Tertiary care hospital**

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**Abstract:** The discovery of antibiotics although was a serendipity it was an important milestone in the history of medicine. Unfortunately in a remarkably short period of time antibiotic resistance started emerging since antibiotics were misused by the doctors and the community. Before endorsing the society at large for abuse of antibiotics it is better to know the level of knowledge of antibiotics amongst the healthcare workers. Hence this study was undertaken to assess the knowledge, attitude and practice of antibiotics among health care professionals. The study was done in a 750 bed tertiary care hospital. Three groups of HCW were selected for the study including 63 junior residents, 100 interns and 165 staff nurses. The study was done using a pretested semi structured questionnaire. Almost 100% of interns knew that virus is the most common cause of common cold whereas only 43% nurses knew virus as the most common causative agent. Sixty five percent of staff nurses replied they will start antibiotics if they develop flu to prevent symptoms from getting worse whereas only 25% of doctors responded they will start antibiotic for flu. Our study revealed that there is a knowledge gap among nurses and to a lesser extent even amongst doctors on use of antibiotics which has to improve since these doctors will be prescribing and advising patients on antibiotics in future.

**Keywords:** antibiotic misuse, healthcare workers, knowledge, attitude and practice

### **INTRODUCTION**

Antimicrobial resistance is one of the major health problems in developing countries like India where relatively easy availability and higher consumption leads to disproportionately higher level of antibiotic resistance. India has the highest infectious disease burden in the world and consequently antibiotics play a critical role in limiting morbidity and mortality[1]. Management of common and lethal bacterial infections has been critically compromised by the appearance and rapid spread of antibiotic resistant bacteria. A recent report showed that inappropriate and irrational use of antimicrobial agents against these diseases led to the increase in development of antimicrobial resistance[2]. Only the extent and percentage of antibiotic resistance varies from country to country but the underlying problem of resistance and misuse remains the same globally.

Inappropriate and irrational use of medicines provides favourable conditions for resistant microorganisms to emerge and spread. Irrational use of antibiotics also involves self-medication, i.e. antibiotics

purchased from pharmacies without prescription, or leftover antibiotics from previous course of treatment[3]. It is estimated that more than 50% of antibiotics worldwide are purchased privately without a prescription from pharmacies[4]. Over the counter purchase of antibiotics is a very common picture seen across our country where antibiotics are dispensed as a single dose therapy even for a milder illness like flu. Once resistant strains are selected, their spread is promoted by factors such as overcrowding and poor hygiene.

There is also inadequate quality assured laboratories, insufficient data analysis and dissemination, and absence of control on sale of antibiotics for public consumption[2]. There are many laboratories in our country which are producing antibiotic sensitivity reports without any quality control measures and these reports are being used for treating patients and on the other hand even if the results are available from standard laboratories physicians fail to value it due to various factors.

There are studies that focuses on public views on irrational antibiotic usage and their results showed that by educating the public on antibiotic usage the antibiotic resistance could be decreased[5,6]. Information on knowledge of antibiotic use and resistance is generally high in developed countries but similar studies in developing countries like India is scarce[7,8]. To the best of our knowledge there are no previous studies analysing the attitude and practice of healthcare professionals on antibiotic use. Hence this study was undertaken to assess the knowledge, attitude and practice of antibiotic use among healthcare workers in a tertiary care hospital.

## MATERIALS AND METHODS

This is a hospital based cross-sectional observational study, among health care workers in different category. This was conducted at a 750 bed tertiary care hospital. The study was done after obtaining the Institute ethical committee clearance. The study group included the healthcare workers who were grouped into 3 subgroups as junior residents, staff nurses and interns. Those who were not willing to participate in the study were excluded. The study population included 63 Doctors (junior residents), 165 Staff nurses, 100 Interns. Considering the prevalence of irrational antibiotic usage among Health care personnel as 25.7 %, with Alpha =5%, Beta =20% and Error of margin as 5%, the minimum sample size was calculated and found to be 293.<sup>9</sup> Stratified random sampling method was used and

the criteria was to use a minimum of 50% of the staff in each strata for the study. Finally a total of 45 junior residents, 160 staff nurses and 90 interns participated (n=295). Informed consent was taken prior to the interview. The study was done by using a pre tested, semi-structured questionnaire. Feedback from other fraternity was obtained to improve the questionnaire presentation and clarity. Participants were made to respond either “yes”, “No” or “Don’t know”. The data was coded and double checked into a work sheet on Microsoft excel 2013. Data compilation and analysis was done using software SPSS 20 version. Proportions and percentage were used to interpret the result.

## RESULTS AND DISCUSSION:

A total of 45 junior residents, 160 staff nurses and 90 interns took part in the study, which represented >50% in each strata/sub group. Their knowledge, attitude & practice regarding antibiotic usage was assessed by using semi-structured questionnaire. Proportions and percentages were used.

Demographic characteristics of the studied health care personnel are tabulated in table 1. Among the various health care personnel surveyed maximum were staff nurses 160 (54.2%) followed by interns 90 (30.3%) and junior residents 45 (15.3%). From the table it is clear that majority were female participants 218 (73.9%) and maximum number of persons 163 (55.3%) belonged to 20-30 years of age.

**Table-1: Demographic characteristics of health care personnel.**

S.no	Demographic characters		Number (n=295)	Percentage
1.	Designation	Junior residents	45	15.3%
		Staff nurses	160	54.2%
		Interns	90	30.3%
2.	Sex	Male	77	26.1%
		Female	218	73.9%
3.	Age	<25	107	36.3%
		25 – 30	163	55.3%
		>30	25	8.5%

Responses for knowledge questions are tabulated in table 2. Ten questions assessed the knowledge of health care personnel about antibiotic usage and resistance. Almost 100% of the interns knew that virus is the causative agent for cough and cold, but only 43% of nurses knew virus is the most common causative agent. The majority of URTIs are of viral origin, due to *rhinovirus*, *para influenza virus*, *coronavirus*, *adenovirus*, *Coxsackie virus*, and *influenza virus*[10]. However, pharyngitis and the common cold have the greatest probability of being of viral origin[11]. Only 10% of URTIs has been attributable to bacterial aetiology, with the three most common organisms being *Streptococcus pneumoniae*,

*Haemophilus influenzae*, and *Moraxella catarrhalis* [12].

Eighty seven percent of Interns and 78% of resident’s opined antibiotics are ineffective in cough and cold but only 30% of nurses felt antibiotics are ineffective in this condition, the majority of them have felt antibiotics are effective. More than 50% of staff nurses and 40% of residents responded that antibiotics have a role in acute diarrhoea which is not true as most of the uncomplicated cases of diarrhoea are caused by viruses. This is similar to a study done in New Delhi which showed that 43 to 57% of patients with diarrhoea received antibiotic[13].

Majority of the nurses and interns felt antibiotics will be effective in sore throat which is not true as most of the throat infections are caused by viruses and antibiotics definitely have no role in treatment of viral infections.

Regarding the usage of antibiotics and subsequent resistance to it, majority of the health care

workers are aware that increased usage will lead to resistance and majority of them opined that antibiotic resistant bacteria are not cured easily. Our study revealed 100% of junior residents and 98.9% of interns consider antibiotic resistance as a national problem which was similar to a study conducted by Pulcini et al[14].

**Table 2 : Number of correct response for questions on knowledge regarding antibiotic usage**

S.no	Questions regarding knowledge on antibiotic usage	Junior resident (n=45)	Interns (n=90)	Staff nurses (n=160)
1.	Virus is the most common cause for cough and cold	41 (91.1%)	90 (100%)	69 (43.1%)
2.	Antibiotics are ineffective in most cough and cold	35 (77.8%)	78 (86.7%)	49 (30.6%)
3.	Antibiotics are ineffective in sore throat	26 (57.8%)	31 (34.4%)	44 (27.5%)
4.	Antibiotics are ineffective in diarrhoea	26 (57.8%)	62 (68.9%)	78 (48.8%)
5.	Antibiotics do not cure all types of infections	33 (73.3%)	78 (86.7%)	74 (46.3%)
6.	Antibiotic resistance means bacteria would not be killed by antibiotics	32 (71.1%)	71 (78.9%)	126 (78.8%)
7.	When antibiotics are taken for wrong indications, this will lead to antibiotic resistance	36 (80%)	84 (93.3%)	118 (73.8%)
8.	If antibiotics are taken for a long time, bacteria will become resistant	34 (75.6%)	73 (81.1%)	113 (70.6%)
9.	Infections caused by antibiotic resistant bacteria cannot be cured easily	36 (80%)	78 (86.7%)	138 (86.3%)
10.	Antibiotic resistance has become a problem in India	45 (100%)	89 (98.9%)	120 (75%)

Responses for attitude based questions are tabulated table 3. Seven questions assessed attitudes toward use of antibiotic. Sixty five percent of staff nurses replied that they will start antibiotics if they develop flu like symptoms to prevent the symptoms from getting worse. This shows that knowledge of antibiotic use during cough and cold among nurses is not adequate and such misconception may lead to inappropriately high rates of antibiotic consumption. But only 15% of interns and 25% of residents responded they will start antibiotics for flu. This reflects that majority of these doctors hopefully will not prescribe antibiotic for a flu which is a promising future for prevention of antibiotic resistance. Eighty five

percent of residents and seventy two percent of interns felt use of antibiotics will not speed up the recovery of cough and cold. Majority of the health care workers said that they will not take left over antibiotics, if they develop similar symptoms later. Our study revealed that 93% of interns and 80% of junior residents had adequate knowledge on inappropriate use of antibiotics which was similar to a study done on physicians in Khartoum state hospital and on medical students of JNIMS, Imphal and Manipur[15,16]. Though most of the healthcare workers are aware that antibiotic resistance is a national problem none are aware about the existence of any such programs for antibiotic resistance.

**Table 3: Number of appropriate response for questions on Attitude regarding antibiotic usage:**

S.no	Questions regarding attitude towards antibiotic usage	Junior resident (n=45)	Interns (n=90)	Staff nurses (n=160)
1.	If I catch a cold, I will not start antibiotics	34 (75.6%)	77 (85.6%)	57 (35.6%)
2.	I don't believe that the use of antibiotics will speed up the recovery of cold and cough	38 (84.4%)	65(72.2%)	55(34.4%)
3.	I will not take the left over antibiotics when I have similar flu like symptoms later	42 (93.3%)	80 (88.9%)	120 (75%)
4.	I know that misuse of antibiotics is a leading cause of resistance	45(100%)	90 (100%)	150 (93.8%)
5.	It is necessary to know about antibiotic resistance	45(100%)	90 (100%)	160 (100%)
6.	I think awareness about antibiotic resistance should be created among public	45(100%)	89 (98.9%)	150 (93.8%)
7.	I am aware of programs held about the importance of antibiotic resistance	12 (26.7%)	40(44.4%)	46 (28.7%)

Response for practice based questions are tabulated in table 4. Forty percent of residents, 33% of nurses and 53% of interns said they will self-medicate with an antibiotic. Most of them stated convenience as the most common reason for self-medication and only negligible percentage of healthcare workers felt cost saving as the reason for self-medication. Majority of the healthcare workers (>80%) said they will not stop the prescribed antibiotic during the course of treatment and more than 80% of residents and interns had the habit of consulting a physician before starting an antibiotic which was similar to a study conducted in South India

where the majority (93%) of the health care workers always consulted a physician before starting an antibiotic and most of them (74.2 per cent) completed the full course of the prescribed treatment[17].

More than 90% of healthcare workers said they will consult a physician and then buy an antibiotic even if they get a similar illness later. Sixty seven percent of residents, 86% of nurses and 88% of interns said they will not switch to another antibiotic during the course of treatment and would do so only if the antibiotic did not work.

**Table 4. Responses for practice regarding antibiotic usage**

S.no	Questions regarding practice on antibiotic usage	Junior resident (n=45)	Interns (n=90)	Staff nurses (n=160)	
1.	I have self medicated with antibiotic	18 (40%)	47 (52.2%)	52 (32.5%)	
	Because	a. Cost saving	0	2 (4.2%)	8 (15.4%)
		b. convenience	13 (72.2%)	35 (74.5%)	42 (80.8%)
		c. others*	5 (27.8%)	10 (21.3%)	2 (3.8%)
2.	I will increase the dose of antibiotic during the course of treatment	6 (13.3%)	11 (12.2%)	13 (8.1%)	
	Reason	a. Symptoms do not subside	6(100%)	10 (90.9%)	11 (84.6%)
		b. To recover faster	0	1 (9.1%)	2 (15.4%)
		c. Expiry date is nearer	0	0	0
3.	I will stop taking the prescribed antibiotic during the course of treatment	9 (20%)	26 (28.9%)	23 (14.4%)	
	Because	a. Symptoms got better	1 (11.1%)	13 (50%)	17 (74%)
		b. Adverse reaction occurred	8 (88.9%)	13 (50%)	6 (26.1%)
4.	If I get similar illness later, I will not consult a doctor and I will buy antibiotics on my own	7 (15.6%)	11 (12.2%)	8 (5%)	
	Reason	a. I will buy antibiotics on my own experience	7 (100%)	9 (81.8%)	7(87.5%)
		b. I will ask opinion from relatives or friends	0	0	0
		c. I will get from previous doctor prescription	0	2 (18.2%)	1 ( 12.5%)
5.	I will switch to another antibiotic during the course of treatment.	15 (33.3%)	20 (22.2%)	22 (13.8%)	
	reason	a. the former did not work	15 (100%)	17 (85%)	21 (95.5%)
		b. the latter is one cheaper	0	0	0
		c. To reduce adverse reaction	0	2 (10%)	1 (4.5%)
		d. others**	0	1(5%)	0

Others \* - they tend to self medicate, if they get similar illness in the past

Others\*\*- In case of misdiagnosis, I will switch over to another antibiotic.

## CONCLUSION

Our study shows that interns and residents have a good knowledge on usage of antibiotics and the irrational use can lead to antimicrobial resistance. This study also showed that majority of the doctors do not use antibiotics for infections like cough and cold which are usually caused by virus and they are self-limiting. But the majority of the nurses in our study have misconception that antibiotics are effective even in viral infections like cough, sore throat and diarrhoea. Our study also shows that majority of health care workers do not self-medicate with an antibiotic even if they develop an infection. This study also reveals that impending physicians do not stop the prescribed antibiotic during the course of treatment even if their symptoms get better which could reflect on their patients when they start practicing since stopping the antibiotic during the course is one of the contributing factors for drug resistance. Though most of the doctors and nurses are aware of the antibiotic misuse and subsequent resistance still there is a long journey to achieve this practically. Extensively improving the curriculum and educating the health care professionals by continuing medical education programmes and workshops from the early part of their career will inculcate moral responsibility towards judicious use and prescription of antibiotics especially in a country like ours where there is easy availability of drugs over the counter.

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