

A Study to Assess the Level of Awareness about Antibiotic Use and Its Resistance in MBBS Students of a Private Medical College of Meerut

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Abstract: Antibiotic resistance is rapidly becoming one of the major global health problems of today. Its main reason is the irrational use of antibiotics by unaware and uninformed health care professionals and consumers. Therefore, this study was conducted to assess and increase the awareness of students of MBBS 2017 and MBBS 2018 of a private medical university in Meerut, U.P., India regarding antibiotic misuse and resistance. The study was conducted using a self designed, semi structured questionnaire and analyzed using SPSS software. In this quasi experimental study, 69% students were aware about the injudicious use of antibiotics while only 56.6% had knowledge regarding antibiotic resistance. It was also found that a high number of students self medicated using antibiotics despite being aware of their side effect. Hence it has become necessary to educate the future doctors regarding antibiotic misuse and its ill effects.

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I. Introduction

Discovery of antibiotics, the so called “miracle drugs”^[1] was a milestone in the history of medicine at the time of World War II, when penicillin saved countless of lives^[2] and made antibiotics – “the staple food of modern medicine”. But, the antibiotic era has been remarkably short,^[3] due to the growing problem of antibiotic resistance which has been menacingly spreading its tentacles day by day.^[4]

The problem of antibiotic resistance has become so wide now that WHO, in 2011 gave the theme “Combat drug resistance: no action today means no cure tomorrow” on World health day^[5] to draw attention at international level regarding the global problem of antibiotic abuse.^[2]

Though antibiotic resistance is a global problem, the major chunk of it is in developing countries like India where there is high infectious disease burden^[6] but no regulations regarding prescription writing^[3] as doctors prescribe medicines based on the “more drug better doctor” beliefs of the patients.^[6] This situation is exacerbated by compromised hygiene practices like open defecation, poor health system and lack of containment of infections.^[3]

Other factors that add up to this current degrading situation is the free unchecked availability of OTC drugs,^[7] presence of antibiotics in industrial and hospital effluents with their improper disposal, uncontrolled use of antibiotics in livestock and animal products and the pill – popping tendency of people.^[3]

All this has led to prolonged sickness, extended treatment and unaffordable health care^[3] which is increasing the death rates day by day, thus hindering the achievement of sustainable development goals as said by World Bank.^[1] Considering this clinical and economical impact of antimicrobial resistance,^[8] WHO has developed a global action plan^[1] to nip this problem in the bud.^[6] The plan has five objectives which include improving awareness and understanding of antimicrobial resistance and optimizing the use of antimicrobial medicines. Therefore as today’s students are tomorrows doctors,^[9] it is necessary to assess and increase their

knowledge regarding antibiotic misuse and resistance for which this study was conducted on first and second year medical undergraduates in a private medical college.

II. Material And Methods

Study Setting - Subharti Medical College

Study Population - Students of MBBS-2017,2018 batch

Study Type - Quasi-experimental

Study Duration – 2 months

Sampling Technique - Purposive Sampling

Sample Size - 152

Research Tool - Self-designed semi structured Questionnaire and PowerPoint presentation

Statistical Analysis – Analysis was done by using chi – square test for testing the association between dependent and independent variables and p – value < 0.05 was taken as significant. SPSS software was used for analysis.

Inclusion criteria – All students present and who gave consent for participating in the study

Exclusion criteria – All students who were absent or who did not give consent for participating in the study.

Independent variables – Age, gender, education of father, occupation of father, socio economic status and source of information about antibiotic resistance

Dependent variables – Awareness about injudicious use of antibiotics, Frequency of antibiotic course completion, Reasons for not completing antibiotic course, Frequency of self medication, Awareness about antibiotics, Frequency of OTC antibiotic purchase, Source of information of antibiotic resistance

Methodology – After purposively selecting MBBS 2017 and 2018 batch as the target group for our study, we took permission from the teacher in charge and the students were supplied a self designed semi structured questionnaire with questions to assess the awareness of students regarding antibiotic misuse, antibiotic resistance and probiotics. Then the students were given a 30 minutes power point presentation on this topic and on some other day again the level of awareness of the students regarding antibiotic misuse, antibiotic resistance and probiotics was assessed by the same set of question which were supplied again. The data was entered on Microsoft Excel sheet and was analyzed using SPSS software.

III. Result

In the present study of 152 students, majority of the students i.e. 114 (75%) belonged to the age group of 19 - 20 years while 23 (15.1%) belonged to 17 – 18 years and 15 (9.9%) to 21 – 22 years of age. There were 93 (62.1%) girls but only 59 (38.8 %) boys.

All students belonged to an educated family with 8 (5.3%) fathers who had a professional degree, 131 (86.2%) who had a graduate or postgraduate degree, 1 (0.7%) intermediate pass, 10 (6.6) high school pass and only 2 were (1.3%) middle school pass outs. Most fathers 75(49.3%) were professional by occupation while 24 (15.8%) were semi - professional, 50 (32.9%) were clerical, shop owner or farmer and only 3 (2%) were semi – skilled worker bringing the socioeconomic status of families as either 78 (51.3%) upper middle or 74 (48.7) upper as calculated using modified Kuppusswamy socioeconomic criteria of 2017.

The students in the study group were undergraduates with 66 (43.4%) belonging to MBBS – 2017 and 86 (56.6%) belonging to MBBS – 2018 batch of Subharti Medical College.

Figure1 shows that in our study group, 69.1% students were aware about misuse of antibiotics before the presentation while after it 69.2% students were aware of the same bringing only an increase of about 0.1% which was statistically not significant.

Figure1: Distribution of population according to awareness about antibiotic misuse

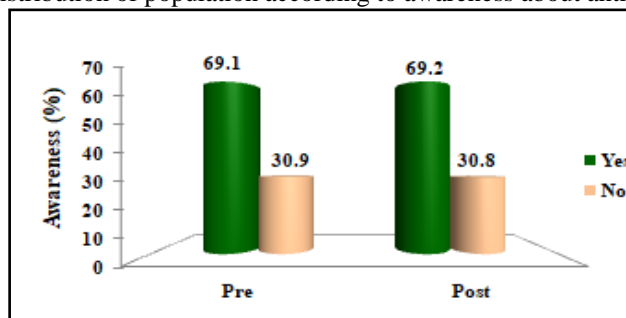


Figure 2 shows that before the presentation 86 (56.6%) of the students of our study group were aware about antibiotic resistance while after it 97 (67.8%) were aware of the same bringing about an increase of 11.2% which was found to be statistically significant.

Figure 2: Distribution of study population according to awareness about antibiotic resistance

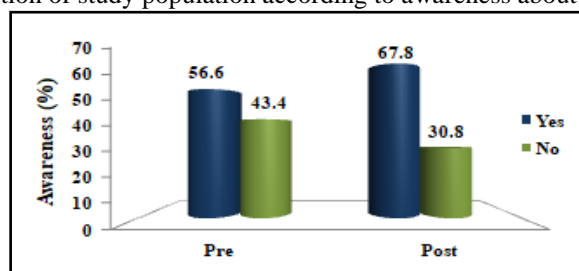


Figure 3 shows the source of information about antibiotic resistance. Majority i.e. 88 (61.5%) students in the study group gained awareness about antibiotic resistance from the medical college followed by 76 (53.1%) from internet, 45 (31.5%) from newspaper, 38 (26.6%) from media, 32 (22.4%) from friends and 22 (15.4%) from others.

Figure 3: Distribution of study population according to source of information about antibiotic resistance

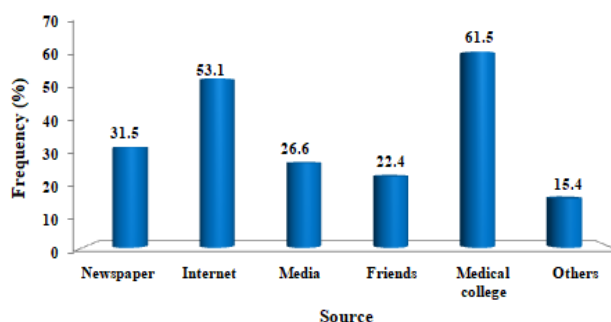


Figure 4 shows that 56.6% of students of our study group always completed the antibiotic course while 43.4% completed the antibiotic course sometimes.

Figure 4: Distribution of students according to completion of antibiotic course

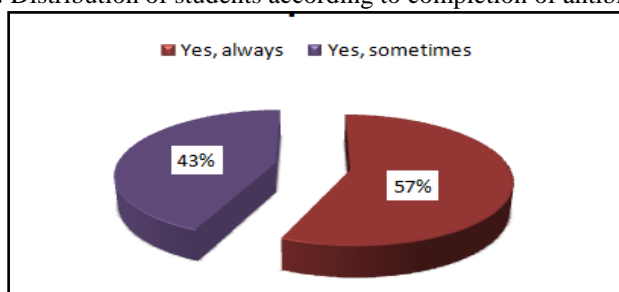


Table 1 shows the various reasons the students had for not always completing the full course of antibiotics. 46 (30.3%) students felt that it was unnecessary to take antibiotics after one gets better before the completing the course so did not complete the course, 15 (9.9%) had side effects, 3 (2.0%) didn't feel the need to take full course while 4 (2.6%) students had other reasons for doing the same.

Table 1: Distribution of population according to reasons for not completing the full course of antibiotics

Reason	No. (%)
Completed the course	84 (55.3)
Got better before completion of course	46 (30.3)
Because of side effects of drug	15 (9.9)
No need to take full course	3 (2.0)
Other reasons	4 (2.6)
Total	152(100)

Table 2 shows the association of frequency of antibiotic course completion with age. In our study group majority of the students of age 19 - 20 years always completed the antibiotic course i.e. 69 (60.5%) while only 45 (39.5%) students completed the antibiotic course sometimes, followed by 17 – 18 age group students of which 13 (56.5%) completed it always and 10 (43.5%) completed it sometimes and only 4 (26.7%) students in the 21 – 22 age group fully completed the antibiotic course, the rest 11 (73.3%) completing it sometimes. This association of antibiotic course completion with age was found to be statistically significant.

Table 2: Association of frequency of antibiotic course completion with age

Age	Frequency of course completion		Total
	Yes, always	Yes, sometimes	
	No. (%)	No. (%)	No. (%)
17 – 18 yrs	13 (56.5)	10 (43.5)	23 (15.1)
19 – 20 yrs	69 (60.5)	45 (39.5)	114 (75)
21 – 22 yrs	4 (26.7)	11 (73.3)	15 (9.9)
Total	86 (56.6)	66 (43.4)	152 (100)
Pearson's Chi Square = 6.186		df = 2	P Value = 0.045

Table 3 shows the association between the reasons for not completing the antibiotic course and the occupation of students' fathers. Out of 75 (49.3%) students who had professional fathers, majority completed full course of antibiotic while some did not as 21 (28.0%) students got better before completing the course, 4 (5.3%) had side effects and 3 (4.0%) had other reasons. 50 (32.9%) students had clerical, shop owner or farmer fathers and out of them though 27 (54.0%) completed their full course, 18 (36.0%) got better before completing the course so did not complete it, 3 (6.0%) had side effects and 2 (4.0%) did not feel the need to take full course. 24 (15.8%) students had semi professional fathers, majority i.e. 8 (33.3%) of them had side effects and 6 (25%) got better before completing the course while 9 (37.5%) students completed their antibiotic course. This result was found to be statistically significant.

Table 3: Association between reasons for not completing the antibiotic course and the occupation of student's fathers

Father's occupation	Reasons					Total
	Got better before completion of course	Because of side effects of drug	No need to take full course	Other reasons	Completed the course (not applicable)	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Semi – skilled worker	1 (33.3)	0 (0)	0 (0)	0 (0)	2 (66.7)	3 (2.0)
Clerical, shop owner, farmer	18 (36.0)	3 (6.0)	2 (4.0)	0 (0)	27 (54.0)	50 (32.9)
Semi – professional	6 (25.0)	8 (33.3)	0 (0)	1 (4.2)	9 (37.5)	24 (15.8)
Professional	21 (28.0)	4 (5.3)	1 (1.3)	3 (4.0)	46 (61.3)	75 (49.3)
Total	46 (30.3)	15 (9.9)	3 (2.0)	4 (2.6)	84 (55.3)	152 (100)
Pearson's Chi Square = 22.735				df = 12	P Value = 0.030	

Table 4 shows the association of frequency of self medication of antibiotics with their awareness. Out of the majority of students who were aware about antibiotics, 49 (63.6%) students frequently self medicated while out of 75 (49.3%) students who were not aware about antibiotics only 24 (32%) students self medicated with antibiotics. This association was hence found to be statistically significant.

Table 4: Association of frequency of self medication with antibiotics with awareness about them

Awareness about antibiotics	Frequency of self medication		Total
	Yes	No	
	No. (%)	No. (%)	No. (%)
No	24 (32.0)	51 (68.0)	75 (49.3)
Yes	49 (63.6)	28 (36.4)	77 (50.6)
Total	73 (48.0)	79 (52.0)	152 (100)
Pearson's Chi Square = 15.234		df = 1	P Value = 0.000

IV. Discussion

Awareness about antibiotic misuse: In our study group of 152 students, 69.1% were aware about ill effects of injudicious use of antibiotics which was very similar to the results reported by Bharath Kumar VD et al. (2018) ^[10] in their study done in Karnataka where awareness was found to be 70.5%.

Our result was comparatively higher than the result reported by BharathKumr VD et al. (2015) ^[11] in their study done in Karnataka where awareness was found to be 58%, while it was lower than the result reported by Dutt et al. (2019) ^[12] in Kannur which was more than 75%.

Awareness about antibiotic resistance: 56.6% students in our study were aware about antimicrobial resistance. Our result was lower than the result reported by Brahmhatt KR et al. (2018) ^[13] in Gujarat where 79% participants were aware about it. Shaik et al. (2017) ^[4] survey done in Odisha also reported a higher awareness of 64% among their students as compared to ours. As for Bharath Kumar VD et al. (2015) ^[11] study done in Karnataka, only 35% students were aware about antimicrobial resistance showing a lower level of understanding of this concept as compared by our results.

Source of information about antibiotic resistance: 61.5% students gathered information about antibiotic resistance from medical college, 53.1% from internet, 31.5% from newspaper, 26.6% from media, 22.4% from friends and 15.4% from other sources. Bharath Kumar VD et al. (2015) ^[11] reported that in their study group, newspaper (31%) and medical college (30%) were source of awareness regarding antibiotic resistance among participants which was only partly consistent with our results. Bharath Kumar VD et al. (2018) ^[10] in their study in Karnataka reported that newspaper (31%) and medical college (30%) were the source of first awareness regarding antibiotic resistance among 1st year students whereas in about 59% of 2nd year students medical college was the first source of knowledge regarding antibiotic resistance which was similar to the results of our study.

Practice of antibiotic course completion: In our study group, 56.6% students always completed full course of antibiotics while 43.4% completed it sometimes while in the Sharma et al. (2016) ^[7] survey in Kerala, 68.2% students always completed the antibiotic course which was higher than the result of our study. Sanya TE et al. (2013) ^[14] in their study in Nigeria report a slightly lower compliance with antibiotic course completion compared to our study as only 42% participants always completed the course. The study done by Desai et al. (2016) ^[2] in Karnataka, showed a very low compliance to antibiotic course completion as compared to our study as only 19.8% patients completed full regimen prescribed by the doctor.

Reason for not completing the full course of antibiotic: In our study the main reason behind the non – completion of antibiotic course was that the students felt that it was unnecessary to take antibiotics after one felt better as was the case with 30.3% students, while 9.9% students had side effects from the drugs so left the antibiotic course in the middle and 2.6% had other reasons. Similar results to our study were reported by Sanya TE et al. (2013) ^[14] in Nigeria where 28.5% students stopped taking antibiotics on resolution of symptoms and 21.5% didn't specify any reason for doing so.

Association of frequency of antibiotic course completion with age: In our study population of 152 students, 56.5% from the 17 – 18 years age group, 60.5% from the 19 – 20 years age group and 26.7% students from the 21 – 22 years age group always completed the full course of prescribed antibiotics. Similar to our results Alkhuzaei AMJB et al. (2017) ^[15] in their study done in Qatar reported that older attendants were less likely to complete the full course of antibiotics compared to the younger ones. Assiry A et al. (2017) ^[16] in their study in Saudi Arabia state that 66.7% participants of 11-30 age group completed full course of antibiotics, wherein compliance with the course decreased with increasing age which was partly consistent with our study.

Association between reasons for not completing antibiotic course and father's occupation: In our study group, we observed association between reasons for not completing antibiotic course and father's occupation. Getting better before the completion of course was found to be one of the main reasons for not completing the full antibiotic course. 33.3% of students with semi – skilled fathers, 36% of students with clerical, shop owner or farmer fathers, 25% of students with semi – professional fathers and 28% of students with professional fathers didn't complete the course after getting better. 33.3% of students with semi

professional fathers didn't complete the antibiotic course because of the side effects of the drugs. None of the studies could be found for discussion that had assessed this association.

Association of frequency of self medication of antibiotics with awareness about them: Our study group had 152 medical students. 50.6% of these students were aware about antibiotics, out of which 63.6% frequently self medicated while out of 49.3% students who were not aware about antibiotics only 32% self medicated using antibiotics giving a statistically significant association which stated that frequency of self medication was seen more in students who were aware about antibiotics than the students who weren't. Awad AI et al. (2015)^[17] in their study in Kuwait reported that, there was no significant relationship between self medication and respondents' knowledge about antibiotics which was opposite to the observed result of our study.

V. Conclusion

Awareness of students regarding antibiotic resistance has increased significantly and it has been found that those who are aware of antibiotics are more likely to self medicate with them which is a wrong practice and should be strongly discouraged.

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