Impact of Educational Intervention on Personal Use of Antibiotics among Medical Students in a Tertiary Care Hospital

Maleha Butul[1*], Naseem Begum[2], Fouzia Nausheen[3], Juwaria Masood[4], Nabiha Subhani Misbah[5], Syeda Advia Sanobar[6]

[1,] *Associate Professor, Department of Pharmacology, ESIC Medical College and Hospital, Hyderabad, Telangana, India.*

[2] *Associate Professor, Department of Pharmacology, Shadan Institute of Medical Sciences, Hyderabad, Telangana, India.*

[3] *Professor, Department of Pharmacology, Ayaan Institute of Medical Sciences, R.R District, Telangana, India.*

[4,5] *Postgraduate, Department of Pharmacology, Shadan Institute of Medical Sciences, Hyderabad, Telangana, India.*

[6] *Research analysts, Department of Pharmacology, Dr.VRK Women's Medical College, R.R District, Telangana India.*

butulmaleha67@gmail.com, drnaseembegum10@gmail.com, drfouzianausheen@yahoo.co.in, omerzuha@gmail.com, nabiha.subhani@yahoo.com, sanobarsyeda20@gmail.com,

*Corresponding Author:
Dr. Maleha Butul,
MBBS, M.D, DM
Associate professor,
Department of Pharmacology,
ESIC Medical College and Hospital,
Sanath Nagar, Hyderabad, Telangana, India.

Abstract:

Introduction: Antimicrobial resistance (AMR) is due to misuse and overuse of antibiotics in general population. Hence Knowledge attitude and practice (KAP) about antibiotic use and awareness of antimicrobial resistance was assessed pre and post educational intervention among 2ndyear medical students.

Methodology: Total of 283 medical students participated in this cross sectional study done in December2021 to February2021. Informed consent was taken and questionnaire given before and after educational intervention. Intervention was done by taking lectures and small group discussion related to antimicrobial therapy and mechanism of resistance by faculty. Questionnaire distributed consisted of demographic details, information on personal use of antibiotics; awareness of antimicrobial resistance and sources of information on AMR. KAP pre and post intervention was analyzed for students. Percentage change of ≥40% in correct responses post intervention, were considered as statistically significant change in their KAP. SPSS 20.0 was used for data analysis.

Results: Of 283 students, 76.7% were females and 23.3% males, 54.1% were between 21-22 years. Study revealed an overall improvement($p<0.000$) post-test in knowledge and practice questions compared to attitude($p=0.0583$). Overall mean score of 18.82 ± 2.07 pre-intervention changed to 25.12 ± 2.19 post-interventions respectively indicating a significant improvement observed in KAP post intervention*($p<0.000$)*. Male students (94%)and(86%) outperformed girls (86%)and(83%) in knowledge and attitude respectively. Female students showed shift in practice (87%)vs(73%) compared to males respectively.

Conclusion: Assessment of student's idea of drug use at an early stage gives an insight into their prescribing behavior in future. Present study student's exhibited good understanding about antimicrobial resistance and desired to alter their practice post-intervention. As students are more influenced by social network sites, awareness campaigns through media related to public health is also recommended.

Keywords: Antibiotic misconceptions and misuse, Cross-sectional study, In-appropriate antibiotic use, Prevalidated Questionnaire.

Introduction:

Antimicrobial resistance (AMR) is a global problem that compromised effective treatment of infectious diseases. About 670,000 new infections recorded every year in India are due to resistance.[1] Antibiotic resistance is due to misuse and overuse of antibiotics, as well as poor infection prevention and control.[2] The World Health Organization(WHO) is working on creating awareness among health care workers as one of its strategies to reduce the rate of emergence and transmission of AMR.[3]

A multi country public awareness survey conducted by WHO in 2015 highlighted deficits in judicious use of antibiotics.[4] Community intervention programmes become essential elements in increasing awareness and changing behaviours towards proper use of antibiotics.[5] Specific questionnaires pre and post intervention can be used to measure changes in Knowledge, Attitudes and Practices (KAP) in the target population. Data obtained from KAP studies are essential in planning and implementing public health programs. Therefore it is important to use reliable and valid instruments to ensure a good quality research.[6]

The study aimed to identify student's KAP regarding correct use of antibiotics. Improved understanding of antimicrobial use, misuse and resistance may help them in developing prescribing behaviours that work towards decreasing burden of AMR in community in future. Using different methods of educational strategies, improvement in knowledge and attitude of the health care professionals have been carried out in different parts of the world. These include the use of didactic lectures, presentations, posters relating to antimicrobial judicial use and reporting of resistant organisms, different modes of reminders, use of safety bulletins and safety newsletters among others. A multidimensional approach to changing provider's behaviour is thus observed as key to a successful intervention.[7]

We expect that present study, would give them a chance to focus on the issues pertaining to antimicrobial resistance which has presently become a global threat.

Hence after reviewing questionnaires previously used in similar studies[8-10], validated study questionnaire was used among second year medical students as tool for assessment of rational antibiotics use and awareness regarding antimicrobial resistance.

METHODS:

The study is a cross sectional; KAP questionnaire based observational study using pretested and validated questionnaire.[11-13] Study was conducted at Shadan, Dr.VRK and Ayaan Institute of Medical Sciences and Tertiary Care Hospitals and Research Centre situated at in and around Hyderabad; India, during December2021 to February2022. After Institutional Ethics Committee approval (012/SIMS/Research/2021), 359 second year medical students were invited to participate in study. A Prevalidated questionnaire was distributed after taking informed consent from the students. A total of 283 participants who answered questionnaire at a single point of contact were included in the study. Students who did not give consent and those absent were excluded from the study.

Questionnaire had 9 main questions grouped into four sections each; section I was about demographic details, section II obtained information on personal use of antibiotics;

section III related to awareness of antimicrobial resistance, section IV comprised sources of information on AMR.

Study procedure:

Study questionnaire was given before and after educational intervention by the concerned faculty. It included didactic lectures to large group in addition to making students form small groups in order to discuss, analyse and come to a therapeutic conclusion regarding issues related to antimicrobial therapy and mechanism of resistance. The KAP survey questionnaire was analyzed according to each question and their percentage value was calculated. An improvement of ≥40% in correct responses, post intervention was evaluated.

Sample Size:

Rao software for sample calculation was used. Sample size of ≥257 students was considered to be sufficient with the assumption of 5% margin of error, 90% confidence level, 40% expected maximum correct answer for the questions about knowledge of AMR and 20% contingency for non-response.

Data Analysis:

Homogeneity of the data was tested using Kolmogorov Smirnov test *(p>0.05)*. Comparison of KAP among medical student's pre and post intervention was done using Chi square test. The overall effectiveness of the intervention on student's KAP was analysed by Wilcoxon-sign rank test. The effectiveness of educational intervention between male and female students was compared using Mann–Whitney U-test. Misuse, misconceptions were analysed using proportions and frequencies. *P<0.05* was considered statistically significant. SPSS 20.0 software was used to analyse data.

Methods of Measurement (Scoring)

A score of 1 was given for each correct response while zero for incorrect or 'No idea' response. Mean score of students, was evaluated by number of correct responses each student showed for 13 knowledge questions, 9 attitude questions and 11 practice questions. Mean as a cut-off point was used as there was no cut-off point to assess good and fair knowledge. Hence scores above and equal to the mean indicate Good knowledge, appreciable practice, and a positive attitude, whereas scores below the mean indicated poor knowledge, poor practice, and a negative attitude.

Results:

Demographics:

Of the total 359(137+89+133) students in second-year, 283(118+74+91) participated in pre and post-test sessions each, with 100% response rate. Remaining participants (76) were either absent or did not take questionnaire to answer. About 76.7% females and 23.3% males participated in the study. Majority of participants (54.1%) were between 21to 22 years and belonging to middle income group (64.6%). Most of them (37.1%) had taken antibiotics one month prior to study, 27.91% had never taken antibiotics in last 6months, and 29% could not remember taking antibiotics. About 77.4% had received prescription for antibiotics. Socio demographic data and use of antibiotics are tabulated in Table 1.

Table 1: Socio-Demographic Data of the Study Participants

Characteristics	Institute 1 n=118	Institute 2 n=74	Institute 3 n=91	Total n=283
Age				
19-20 years (n, %)	50(42.37)	29(39.19)	37 (40.66)	116 (41%)
21-22 years (n, %)	64(54.24)	41(55.4)	48 (52.74)	153 (54.1)
23-24years (n, %)	4 (3.38)	4 (5.4)	6 (6.6)	14 (4.9%)
Gender				
Males	27 (22.88)	0	39 (42.86)	66 (23.3%)
Females	91 (77.12)	74 (100)	52 (57.14)	217 (76.7%)
Socio-economic status				
Upper Class	9 (7.63)	7 (9.46)	18 (19.78)	34 (12%)
Middle Class	90 (76.27)	42 (56.76)	51 (56.04)	183 (64.6%)
Lower Class	0	4 (5.41)	2 (2.20)	6 (2.1%)
Did not answer	19 (16.10)	21 (28.38)	20 (21.98)	60 (21.2%)
Last intake of antibiotics				
In the last month	41 (34.75)	25 (33.78)	39 (42.86)	105 (37.1%)
Never in the last 6 months	37 (31.36)	20 (27.03)	22 (24.18)	79 (27.9%)
Can't remember	33 (27.97)	26 (35.14)	23 (25.27)	82 (29%)
Did not answer	7 (5.93)	3 (4.05)	7 (7.69)	17 (6%)
Received prescription for the antibiotics				
Yes	91 (77.12)	58 (78.38)	70 (76.92)	219 (77.4%)
NO	27 (22.88)	16 (21.62)	21 (23.08)	64 (22.6)

Assessment of participants KAP component:

To assess KAP chi square test was used for analysis. There was an overall improvement *(p<0.000)* in correct responses post-test for most statements related to 'idea about personal use of antibiotics and problem of antimicrobial resistance. (Table 2)

Table 2: Knowledge Regarding Personal Use of Antibiotics and its Resistance among Medical Students (n =283)

Items	Correct Response	Pre-test (n, %)	Post-test (n, %)	*P value*
Each type of infection needs a different antibiotic	Yes	200 (70.7)	236 (83.4)	0.000^{**}
Antibiotics are effective against viruses	No	202 (71.4)	210 (74.2)	0.509^{ns}
If antibiotics are consumed in excess, they will not work when they are really needed	Yes	236 (83.4)	263 (92.9)	0.001^{*}

Antibiotics can kill the bacteria that normally live on the skin and in the gut	Yes	191(67.5)	236 (83.4)	*0.000***
Antibiotic resistant bacteria can spread from one person to another	Yes	134 (47.4)	195 (68.9)	*0.000***
Antibiotic resistance is only a problem for people who take antibiotics regularly	No	119 (40)	173 (56.2)	*0.000***
Antibiotic resistance is only a foreign issue that affects other countries	No	237 (83.8)	259 (91.5)	*0.007**
Antibiotic resistance problem can affect me and my family	Yes	203 (71.7)	241(85.2)	*0.000***
Infection caused by a resistant bacteria can be very difficult to treat	Yes	247 (87.3)	256 (90.5)	*0.285 ns*
Many infections are becoming increasingly resistant to treatment by antibiotics	Yes	252 (89.1)	274(96.8)	*0.000***
Antibiotic resistance occurs when your body becomes resistant to antibiotic	No	95 (33.8)	101(35.7)	*0.659 ns*
Medical procedures like surgery may be made more dangerous with antibiotic resistance	Yes	177(62.5)	254(89.8)	*0.000***
The use of antibiotics in animals is an important cause of appearance of new resistance to pathogenic agents in humans.	Yes	108 (38.2)	218(77)	*0.000***

***= $p<0.001$, *= $p<0.05$, ns= $p>0.05$, Chi Square test used for analysis

There was a non-significant change observed in attitude *($p>0.05$)* for questions related to personal use of antibiotics. (Table 3)

Table 3: Attitude of Medical Students towards Personal Use of Antibiotics (n =283)

Items	**Correct Response**	**Pre-test (n, %)**	**Post-test (n, %)**	***P value***
I expect my doctor to prescribe antibiotics if I suffer from common cold or flu symptoms	Disagree	177(62.5)	200 (70.8)	*0.050 ns*
It is good to be able to get antibiotics from relatives or friends without having to see a medical doctor	Disagree	266 (94)	269 (95)	*0.712 ns*
If I feel mild side effects during a course of treatment of antibiotics, I should stop taking them as soon as possible	Disagree	97 (34.3)	125 (44.2)	*0.312 ns*
I trust the doctor's decision if s/he decides to prescribe or not prescribe antibiotics	Agree	268 (94.7)	269 (95.1)	*1.000 ns*
If I believe that I need an antibiotic and the doctor did not prescribe it, I will get it	Disagree	246 (86.9)	261 (92.2)	*0.053 ns*

at pharmacy without a prescription				
I am convinced that new antibiotics will be developed to solve the problem of resistance.	Agree	186 (65.7)	248 (87.6)	*0.000***

**= *p<0.001* *= *p<0.05* ns= *p>0.05*, Chi Square test used for analysis

Practice domain showed a significant improvement post-test *(p<0.000)* in their idea about personal use of antibiotics and antimicrobial resistance. (Table 4)

Table 4: Practice Regarding Personal Use of Antibiotics among Medical Students (n =283)

Items	**Correct Response**	**Pre-test (n, %)**	**Post-test (n, %)**	***P value***
When I get a cold, I take antibiotics to help me feel better faster	No	182 (64.3)	193(68.2)	*0.374 ns*
If I feel better after a few days, I sometimes stop taking my antibiotics before completing the course of treatment	No	180 (63.6)	204(72.1)	*0.038**
When I have a sore throat, I prefer to use an antibiotic	Yes	120 (42.4)	155 (54.8)	*0.004**
I take the antibiotics according to the doctor's instruction	Yes	274 (96.8)	278 (98.2)	0.418 ns
I prefer to keep antibiotics at home in case there is a need for them later	No	77 (27.2)	120 (42.4)	0.000**
Doctors often explain clearly to the patient the reasons for prescribing or not prescribing antibiotics	Yes	123 (43.5)	162 (57.3)	*0.001**
Doctors often explain clearly to the patient the instructions for the use of antibiotics	Yes	208 (73.5)	211(74.6)	*0.848 ns*
Two of the main causes of the appearance of antibiotic resistance are patient self-medication and antibiotic misuse.	Yes	248 (87.6)	273 (96.5)	*0.000***
In a primary-care context, one should wait for the microbiology results before treating an infectious disease.	Yes	223 (78.8)	231(81.6)	*0.460 ns*

**= *p<0.001*, *= *p<0.05*, ns= *p>0.05*, Chi Square test used for analysis

According to them, doctors (40%) were the major source of information for antimicrobial resistance for majority of participants, followed by receiving information from social media and internet forums (29%).

When idea about conditions treated with antibiotics was assessed, there was an improvement post lectures in their understanding that antibiotics are used to treat pharyngitis(25.3%,*p<0.000*), bladder-infections(11.4%,*p=0.007*) and are not used for

traveller's diarrhea(26%,*p=0.008*) and HIV infection(7%,*p=0.023*). There was a non-significant change for cold and flu(18%,*p=0.053*), skin and wound infections(0.9%, *p=0.602*), fever(3.8,*p=0.795*), headaches(7.3%,*p=0.052*), malaria(5.1%,*p=0.553*) and measles (0.9%, *p=0.923*). Chi square test was used for analysis.

When sectors targeted to slow down emergence of AMR was studied, significant improvement was observed post intervention. They understood importance of Hospital hygiene(24.8%, *p=0.003*) and reduction of Antibiotics use in hospitals(34.2%,*p<0.000*). But according to them Animal farm hygiene(10.5%,*p=0.429*), Private food hygiene(13.3%,*p=0.296*), Antibiotics intake by patients(5.6%,*p=0.112*), Antibiotics prescription by doctors(10.9%,*p=0.113*), and Antibiotics use in livestock(0.7%,*p=1.000*) was not important to slow down resistance. Chi square test was used for analysis.

Overall effectiveness of intervention on KAP among students:

The pretest mean ±SD score of 7.36±1.162, 5.28± 0.861 and 6.19±1.155 in KAP and post-test mean ±SD score of 10.06± 1.047, 6.99± 1.068 and 8.08± 1.330 respectively was observed. About 51% of participant's (n=144 of 283) had shown knowledge scores above the total mean score by correctly answering 10 of 13 knowledge questions and were considered to have good knowledge. Remaining 49% were considered to have poor knowledge. Similarly 44.5% of participants(n=126 of 283) had shown a good attitude by answering correctly for maximum of 7 of 9 attitude questions compared to 55.5% participants who were below the bench mark. About 50% had displayed good practicing behaviour (n=141 of 283) by answering correctly maximum of 8 out of 11 practice questions post intervention.

The students overall mean score of 18.82 ± 2.074 pre-intervention changed to 25.12 ± 2.195 post-interventions respectively indicating a significant improvement observed in KAP post intervention*(p<0.000)*. Wilcoxon Signed Rank Test used for analysis. (Table 5)

Table 5: Overall Effectiveness of Educational Intervention on KAP among Students (n=283)

Overall effectiveness of intervention on KAP	**Pre intervention**	**Post-intervention**	***p- value***
Mean ± SD	18.82 ± 2.074	25.12 ± 2.195	*P<0.000***

SD= Standard Deviation, **=*p<0.001*, Wilcoxon Signed Rank Test used for analysis

KAP among male and female students measured on a scale of Good Vs Poor:

Male participants showed greater improvement in knowledge when measured on a scale of good(>50% correct responses) (94%Vs86%) compared to females. Remaining 6%vs.14%) were considered Poor(<50% correct-responses). Females showed better practice habits(87%Vs73%). Improvement in KAP was statistically significant(*p<0.000*). Mann–Whitney U-test used. (Table 6)

Table 6: Comparison of KAP in Male and Female Students on a Scale of Good (≥50% correct responses) and Fair (≤ 50% correct responses)

Variables	Group	Pretest		Post-test		p value
		Good n (%)	Poor n (%)	Good n (%)	Poor n (%)	
Knowledge	**Male**	48 (73)	18 (27)	62 (94)	4 (6)	0.000**
	Female	153 (71)	64 (29)	187 (86)	30 (14)	
Attitude	**Male**	38 (58)	28 (42)	57 (86)	9 (14)	0.000**
	Female	129 (59)	88 (41)	181 (83)	36 (17)	
Practice	**Male**	35 (53)	31 (47)	48 (73)	18 (27)	0.000**
	Female	133 (61)	84 (39)	189 (87)	28 (13)	

**= $p<0.001$, Mann Whitney U Test used for analysis

Discussion:

The present KAP study was undertaken to evaluate the understanding of second year medical students regarding antimicrobial use and its resistance. It is important to assess their idea as inappropriate antibiotic use by them may lead to deleterious adverse consequences to them as well to the community. In developing countries misuse and abuse of antibiotics is an alarming situation as antibiotics are available over the counter and purchase of antibiotics without prescription is easier due to unregulated supply chains.[14] Clinical effectiveness of these drugs therefore depends on effective use by all stakeholders like physicians, consumers and the retailers.[15]

When demographic data was analysed, present study showed that 37% of respondents had taken their antibiotics in the last 1month. Use of antibiotics one-month before the study was approximately the same as study done in Ireland(39%)[16] and in Bahir-Dar(35.9%).[17] Our study was conducted between December and February when there is seasonal prevalence of viral or bacterial infections. But use of antibiotics for viral infections may reflect an inappropriate prescribing behaviour by the physicians. Possibly antibiotics are likely to be prescribed under patients pressure.[18]. Hence appropriate education on the aim and action of antibiotics is required. Students should be made aware that antibiotics don't work against viruses and rather would become a contributing factor for antimicrobial resistance.

Most studies showed tendency of self-medication amongst medical students for getting antibiotics without prescription(35%).[19] In our study 77.4% used antibiotics after receiving prescription and 22.6% without prescription. Present study results are consistent with another study[20] where 64.29% participants agreed taking antibiotics after consulting physicians. On contrary, literature review showed respondents in most countries took antibiotics without prescription or as over the counter medicines. India(76%)[21], Ghana (72%)[22], Italy(32.7%)[23], Saudi Arabia(28.8%)[24], reported people taking antibiotics without a prescription. Participants in the current study demonstrated a favourable culture of not making decisions for self-medication. Participants' positive attitudes prior to joining medical college will undoubtedly aid them in educating their patients to use antibiotics solely as prescribed and not on their own.

Regarding issues like use of antibiotics against viruses and spread of resistant bacteria due to use of antibiotics in animals, surprisingly74.2% of participant's was aware, both before and after intervention that antibiotics are not used to treat viral infections. Our results are more than consistent with a study from USA[25] where 65% agreed that antibiotics should not be used to treat viral infections. Misconceptions about antibiotic use for viral infections are present in general public resulting in antimicrobial resistance. Practitioners are also prescribing antibiotics for viral infections especially in children where infections are mostly due to viruses.[26] Same trend became prevalent during Covid19 pandemic where there was misuse(74.6%) of antibiotics revealed through meta-analysis. It was observed from 31 studies that only 8.6% of estimated bacterial coinfection existed.[27] If the issues of resistance and its importance is emphasized during medical training, better outcomes with regard to improving the appropriateness of antibiotic use will ensue. Antibiotic stewardship training may help reduce antibiotic utilization, and decrease incidence of drug resistant infections.

About 7 out of 9 questions showed significant improvement($p<0.000$) post-lectures pertaining to their knowledge regarding antimicrobial resistance. Participant's(61.8%) were unaware that antibiotics use in animals transmits drug resistant bacteria to humans. Presence of antibiotic residues in animal organs consumed by human has become main reasons for antimicrobial resistance. Nirala *et al*,[28] reported presence of tetracyclines, oxytetracyclines, sulfamethoxazole in concentrations >0.1microgm/ml in raw milk. Many other countries have also reported[29,30,31] antibiotic use in animals resulting in resistance. Therefore participants understanding regarding spread of drug resistant bacteria in community through animals are important. Students should acquire attitude and practice behaviour that help in education of patients about AMR. Counselling should be done to reduce the consumption of food harbouring zoonotic bacteria that serve indirectly as vectors of antibiotic resistance genes.

When practice domain was assessed, an appreciable change in responses was observed post-intervention for most of the questions. A significant observation was that very few participants agreed both pre and post-intervention that the pharmacist tells them about the importance of correct therapeutic compliance/adherence. It is very important that all the stake holders like doctors, pharmacists and nursing staff should collaborately aim in reducing medication errors at level of prescription, administration and dispense in order to improve adherence of drugs as non-adherence to antibiotics use may result in antimicrobial resistance. An appropriately trained pharmacist has the potential to influence the behavior of healthcare team members and consumers as well and be part of the solution to overcome the global challenge of AMR.[32] Doctors were the first source of information regarding antimicrobial-resistance followed by information from internet and social media. Other studies[33,34] have also shown that doctors act as the prime contact for any health related information in addition to social media. As social media and internet is forming the major resource for patient information, it is therefore important that these sites should be monitored and appropriate measures taken if any ambiguous information is present because misconceptions can prevail among patients regarding use of antibiotics.

Among various infections, Skin/wound infections and bladder-infections were identified for antibiotic use. This is similar to study[34] where participants correctly identified skin/wound infection(99.2%) and bladder-infection(97.5%) as treatable conditions with

antibiotics. A casual attitude was observed for selecting headache, fever, measles and malaria post-intervention for antibiotic use. It is similar to a previous study where headache(24.9%) was selected for antibiotic use.[12] Another important aspect was use of antibiotics for cold and flu. In present-study, 55%agreed that antibiotics should not be used for cold and flu. Remaining 45% had idea of getting antibiotics for cold and flu. This is similar to other study-responses where participants agreed to use antibiotics to treat cold and flu(44.4%).[12]

According to participants, antibiotics intake by patients was of significance and need to be targeted to reduce antibiotic resistance. Hospital hygiene and antibiotics use in hospitals was also important. Study showed urban and semi-urban population gave utmost importance to hospital hygiene(51.5%) followed by antibiotics prescription by doctors.[35] Options like Animal Farm Hygiene, Antibiotics use in Livestock were observed as least important reasons for resistance.

In summary, initial pretest assessment showed students to have relatively better attitude towards antibiotic use as they answered all attitude questions correctly before and after the intervention. They lacked the desired knowledge required to understand the existing threat of antimicrobial resistance globally and nationally. Post intervention quite a good number of students showed an improvement in their knowledge and practice behaviour. Attitude component was strong before and after the study, hence no significant change was observed. A significant change($p<0.000$) in overall effectiveness due to educational intervention on KAP was noticed in our study. In addition a significant-change($p<0.000$) was noticed in both knowledge and practice compared to attitude and beliefs of participants when male were compared to females. However few misconceptions regarding use and misuse of antibiotics still persisted post intervention.

Hence this emphasizes the need to plan appropriate educational measures through novel methodologies at different levels of students training, in order to bring effective changes in their KAP. Competency based medical education is an integral part of curriculum where details are defined, to ensure that medical graduates are fit for practice.[36] Integrated teaching of prescribing antimicrobials in pharmacology to infection control in microbiology is important. This may help educating students about antibiotics, so that as prescribers, they are fit to prescribe antibiotics, maximise their effective and efficient use and minimize development of drug resistance. Hence teaching methodologies in medical school should aim, not only to increase the knowledge, but also to change the behaviour and values in order to improve patient outcomes and to reduce AMR.

Strengths and Limitations of study:

Present study is first of its kind where educational intervention evaluated the effects of competency based change in curriculum on KAP of antibiotic use. Validated questionnaire was selected through elaborate literature review and tailored made to suit the second year medical students. It consisted of user friendly antimicrobial resistance concepts. Data was analysed in depth in order to derive conclusive idea for taking measures that aid in learning concepts of AMR. Learning gaps of students identified post-intervention was communicated to the concerned faculty to allow them to bring necessary changes in their teaching methods.

Limitations included a casual approach of few participants towards cross sectional study as a research study. Having limited point of contact with the researcher, perhaps failed to stimulate their interest as observed in other long term observational or interventional studies. Secondly, assessment of responses again after a period of 6 months in order to assess student's retention of information was important.

Conclusion:

Evaluation of student's KAP regarding antibiotic use play an important role on drug related issues. It can greatly influence the way; drugs like antibiotics are used and prescribed by them in future. Hence assessment of student's idea of drug use at an earlier stage has become necessary. It may provide valuable information that help towards developing interventions to target AMR. Awareness of enhanced utilization of antibiotics leading to challenges of AMR that the world is facing due to threat from AMR is required. Faculty should collaborately work in the direction of improving participants understanding of concepts of AMR. It is important that KAP-studies should be conducted at frequent-intervals to find out whether in-addition to achieving the learning outcomes and acquiring respective knowledge and skills, their perceptions, values and attitudes also improved when they graduated out of medical schools.

Acknowledgement

Authors would like to thank the students, who participated enthusiastically in this study to know their knowledge gaps regarding antibiotics use.

Conflict of Interests

Authors declare there is no conflict of interest

Funding Sources

There is no funding source.

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