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Research Article

### KNOWLEDGE, ATTITUDE, PRACTICE AND PERCEPTION REGARDING SELF MEDICATION OF ANTIBIOTICS AMONG MEDICAL AND NON- MEDICAL UNDERGRADUATE STUDENTS OF PUNJAB, PAKISTAN

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**Abstract:**

*Introduction: Self-medication is “the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms.”*

*Objective: The objective of the study is to assess the knowledge, attitude and practice regarding self-medication among medical and non-medical students of Punjab, Pakistan.*

*Study setting: The study was carried out among medical and nonmedical undergraduate students of Punjab, Pakistan.*

*Study Design: Cross-sectional observational descriptive study. Duration: 2<sup>nd</sup> April 2020 to 2<sup>nd</sup> June 2020. Sample size: 246 students.*

*Data collection: A predesigned questionnaire was used for the collection of data in this research.*

*The questionnaire consisted of two parts. First part was about bio-data and second part was about the actual research. Data analysis: Data was analyzed. Frequencies were calculated, tables and charts were made. Results: The survey revealed that 88.2% knew that self-medication involves taking medicine without prescription and 93.5% believed that self-medication of antibiotics can lead to health hazards. About 77.2% had information related to dose of course. Regarding side effects 67.1% were aware. About 51.2 % knew about the indications and contraindications of antibiotics.*

*About 58.1% disagreed that self-medication is convenient than consulting doctors while 41.9% thought it's the better option. Only 35.8 % believed that it is okay to self-medicate without a prescription and 23.3% trusted past experiences. During last 6 months 46.3% used antibiotics without prescription.*

*Regarding cause of hazards, 16.2% answered wrong diagnosis, 4.47% answered wrong dosage, 0.81% considered wrong route of administration, 0.4% thought drug interaction, 2.84% answered drug reactions while 80.9% thought all factors play role. About 75.2% participants believed that antibiotics should be taken until the completion of course, 10.6% thought it should be taken for less than 3 days, 7.7% thought it should be taken for more than 7 days, while 6.5% believed it should be continued until symptoms disappear. In case of adverse effects 84.6% would consult a doctor, 10.6% would discontinue the antibiotic, 3.66% would switch to another one and 1.14% would continue the treatment. 61% got to know about the dosage by consulting a doctor, 9.3% obtained information by checking the packet insert, 15% had previous experience, 6.5% found out from friends and family, 8.1% guessed the dose.*

*Conclusion: Most of the participants had adequate level of knowledge, good perception and negative attitude regarding self-medication of antibiotics.*

*Keywords: Self-medication, Antibiotics, Knowledge, Attitude, Practice, Perception.*

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**INTRODUCTION:**

The practice of self-medication is very common in both the developed and the developing countries. The word self-medication was coined in the 1970s when physicians found that heroin addicts were using this practice to get rid of their symptoms of withdrawal [1]. Ever since, the practice has been consistently growing over the years.

The World Health Organization (WHO) defines self-medication as, "The use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms." This practice not only involves buying medicines without prescription but also involves using old prescriptions to buy medicines for a newly developed similar complaint or using extra medicines from family or friends and recommending medicines to family or relatives on your own [2].

It seems like in the present days, a big fraction of population finds it easier to self-medicate rather than visiting a health professional. It is probably because everyone seems to have the idea that they have enough knowledge about medicines and medical field through magazines and internet [1]. Many of the chemists recommend and sell medicines for minor illnesses without any proper knowledge or experience [3], however this practice is not only amoral but also very dangerous [1].

Throughout the world, the use and overuse of non-prescribed medicines especially antibiotics is increasing [2] and so is the incidence of antimicrobial resistance, time span, gravity and mortality associated with the diseases which once used to be a lot less fatal. [4].

Numerous studies have been conducted to evaluate the trends of self-medication with antibiotics among the university students [4]. One such study conducted in Pakistan showed that 45.5% of people self-medicate for minor health issues [03] like cold, cough, fever, flu, diarrhoea and sore throat [2]. Similar statistics are observed worldwide as it is estimated that more than 50% of antibiotics are sold without prescription [5].

Some factors encouraging the practice of self-medication include a diverse range of advertisements of drugs in newspapers, magazines or on internet, easy availability of drugs, lack of education, influence of family and friends, low socioeconomic status, lack of availability of health professionals in the remote health care centres, ignorance for mild sickness and most important is the previous exposure to the same medicine for a similar complaint without any side effects [3]. Even in some situations, doctors are forced to prescribe high doses of antibiotics by a patient who is eager to get rid of the illness [6].

Considering the facts that the risks associated with self-medication outweigh the benefits of low cost, this practice needs to be discouraged. Therefore, a study conducted in India suggests the need to initiate the health education programs for public, in order to improve the knowledge about the uses and adverse effect of antibiotics [2]. Strict rules should also be made regarding the prohibition of sale of drugs without prescription and pharmacies should be kept in check for over the counter sale of prescription-only-antibiotics.

Present study aimed to assess the knowledge of medical and non-medical undergraduate students of Punjab, Pakistan regarding the practice of self-medication, factors which encourage people to adopt it and what measures, in their opinion, can be taken to reduce the prevalence of this unethical and harmful practice.

**METHODOLOGY:**

**Study design, participants and setting:** This cross-sectional survey was carried out among medical and non-medical undergraduate students at higher educational institutions of Punjab, Pakistan. A convenient sampling method was used to draw the sample of 246 students including both male and female from 2<sup>nd</sup> April 2020 to 2<sup>nd</sup> June 2020. The objective of study was explained and those who consented were given the questionnaire.

**Sample size:** Sample was 246 students.

**Inclusion criteria:** Undergraduate medical and non-medical willing students including both genders.

**Exclusion criteria:** Unwilling students.

**Ethical consideration:** Informed consent was taken from all participants (verbal).

**Data collection:** A predesigned and pre-tested questionnaire was used for the collection of data in this research. The questionnaire consisted of two parts. In first part questions about bio data were asked and in second part questions about the actual research were asked after taking their verbal consent.

**Data analysis:** data obtained from questionnaire was analyzed manually. Frequencies were calculated; also tables and figures were made.

**RESULTS:**

In this study, a sample of 246 undergraduate students was taken from all over Punjab. The survey revealed that 88.2% (Medical 94.3%, Non-medical 82.11%) knew that self-medication involves taking medicine without prescription or using an old prescription and 93.5% (Medical: 98.3%, Non-medical: 88.6%) believed that self-medication of antibiotics can lead to health hazards because of wrong diagnosis, route, drug reaction

and interactions. On asking about the information related to dosage, timing and total days in the course, 77.2% (Medical: 84.5%, Non-medical: 69.9%) had an idea about them. More than half of the respondents i.e. 67.1% (Medical: 79.6%, Non-medical: 54.4%) were aware about the possible side effects of the prescribed medication. About half of the participants i.e. 51.2% (Medical: 61.7%, Non-medical: 40.6%) knew about the indications, contra-indications or hypersensitivity before starting an antibiotic course [Table no.1].

Furthermore, it was revealed that 58.1% (Medical: 61.7%, Non-medical: 54.4%) disagreed with the statement that self-medication is convenient and better than consulting doctors while 41.9% (Medical: 38.2%, Non-medical: 45.5%) thought it's the better option. Only a minority of the respondents i.e. 35.8% (Medical: 35.7%, Non-medical: 35.7%) believed that it is okay to self-medicate without a prescription if the previous experience had no side effects and 23.3% (Medical: 17%, Non-medical: 29.2%) trusted their own or their friends' or family members' past experience regarding the dosage, timing and indication of antibiotics more than the doctor's advice. Most of the respondents, i.e. 81.3% (Medical: 91%, Non-medical: 71.54%) believed that making strict policies to limit public access without prescription is the best way to minimise the practice of self-medication [Table no.2]

Our study further revealed, 46.3% (Medical: 47.1%, Non-medical: 45.5%) had used an antibiotic without the doctor's prescription in the last 6 months. Majority of the participants i.e. 71.5% (Medical: 74.8%, Non-medical: 68.3%) always made sure to complete the full course of a particular antibiotic therapy. Less than half, i.e. 33.3% (Medical: 28.4%, Non Medical: 38.2%) had ever experienced any adverse effects of antibiotics. The survey revealed that 29.7% (Medical: 21.1%, Non-medical: 38.2%) changed the dosage during the course of treatment and majority of people i.e. 93.5% (Medical: 96%, Non-medical: 91%) checked the expiry date of the antibiotics before using it [Table no.3].

When asked about the causes of hazards, 10.2% (Medical: 5%, Non-medical: 15%) thought the cause is wrong diagnosis, 4.47% (Medical: 5%, Non-medical: 5%) answered wrong dosage, 0.81% (Medical: 0%, Non-medical: 2%) considered wrong route of administration as the cause, 0.4% (Medical: 1%, Non-medical: 0%) thought drug interaction is the cause, 2.84% (Medical: 1%, Non-medical: 4%) answered drug reactions or hypersensitivity while a large proportion of the participants i.e. 80.9% (Medical: 88%, Non-medical: 74%) thought all factors play their role [Chart no.2,3].

Furthermore, it was revealed that 75.2% (Medical: 84%, Non-medical: 66%) participants believed that antibiotics should be taken until the completion of course as advised by doctor, 10.6% (Medical: 6%, Non-medical: 8%) thought it should be taken for less than 3 days, 7.7% (Medical: 7%, Non-medical: 8%) thought it should be taken for more than 7 days, while 6.5% (Medical: 3%, Non-medical: 18%) believed it should be continued until symptoms disappear [Chart no.4,5]

Analysis of the knowledge regarding the measures taken in case of adverse effects revealed that 84.6% (Medical: 85%, Non-medical: 84%) would consult a doctor, 10.6% (Medical: 10%, Non-medical: 12%) would discontinue the antibiotic, 3.66% (Medical: 4%, Non-medical: 4%) would switch to another one and 1.14% (Medical: 1%, Non-medical: 0%) would continue the treatment [Chart no.6, 7]

More than half of the respondents, i.e. 61% (Medical: 57%, Non-medical: 65%) got to know about the dosage of antibiotics by consulting a doctor, 9.3% (Medical: 11%, Non-medical: 7%) obtained information by checking the packet insert, 15% (Medical: 16%, Non-medical: 14%) had previous experience, 6.5% (Medical: 6%, Non-medical: 7%) found out from friends and family and 8.1% (Medical: 10%, Non-medical: 7%) guessed the dose [Chart no.8,9].

## DISCUSSION:

The study was carried out to assess the awareness, attitude and perception of medical and non medical students regarding self-medication of antibiotics. A total of 246 students from undergraduate colleges of Punjab, Pakistan were interviewed. The results were compiled and compared with researches carried out in Pakistan, China, Malaysia, United Arab Emirates (UAE) and Eritrea.

Detailed analysis revealed that 88.2% students had adequate knowledge that self medication involves procuring medicine without prescription or using old prescription. This was similar to a study carried out in Abbottabad, Pakistan where 71.7% respondents had adequate knowledge about all the parameters of self medication (7). Study revealed that about 93.5% respondents knew that self medication of antibiotics could lead to health hazards because of wrong diagnosis, route, drug reactions and interaction. This was also similar to the study carried out in Abbottabad, Pakistan where 78% respondents had adequate knowledge of the disadvantages of self medication.(7) Before starting an antibiotic course, 77.2% of the participants knew about the dosage and course of the antibiotic. This was similar to the study carried out in United Arab Emirates where 74.9% respondents knew and completed the course of the medicine (6). As regards the health hazards of self

medication, 67.1% had sufficient knowledge of side effects and 51.2% had knowledge of indications, contraindications and hypersensitivity of the particular antibiotic. This was close to the study conducted in Southern Punjab, Pakistan where 72% participants had knowledge of adverse effects (4), but it was in contrast to the study in Malaysia where only 26% respondents had knowledge (2).

The cost and effort required in consulting a doctor for every minor ailment and positive past experiences often prompts people to self medicate. However, in our study, less than half of the respondents i.e. 41.9% agreed that self medication is convenient, low cost and better than consulting the doctor each time. This was in contrast to a study conducted in Eastern China where 85.6% believed this. (8) Our data showed that only 35.8% respondents considered it okay to self medicate if previous experience had no adverse effects. A similar study conducted in Peshawar Pakistan showed that 30.6% participants preferred self medication (3) however; our results were in contrast to the study conducted in Eastern China where 85.6% respondents considered self medication a good/acceptable practice (8). About 23.3% respondents trusted their family members' or friends' advice more than a doctors'. This was similar to the study in Malaysia where 8.9% participants considered lack of trust in the doctor a reason to self medicate (2).

Despite being wary of the hazards of self medication, many people still tend to use an antibiotic without consultation from a health professional. In our study, 46.3% respondents had used an antibiotic without prescription in the last 6 months. This was close to the results in a study conducted in Western China where 40.2% had self medicated in the past 6 months (9). Most (71.5%) respondents made sure to complete the course of the antibiotic, similar to the study conducted in UAE where 74.9% respondents completed the course (6), but in contrast to the study in Asmara, Eritrea where 42.6% participants finished the course (10). Analysis further revealed that about 33.3% students had experienced adverse effects during the therapy, similar to the study conducted in Western China where 16.7% respondents had experienced side effects (9). About 29.7% students changed the course during the course of therapy, similar to the study in Western China where 44.5% respondents did this (9). Most (93.5%) of the respondents checked the expiry date of the antibiotic before starting the course, which was similar to the study conducted in Rupandehi District Nepal, where 85.8% respondents checked it (11).

People often have different understanding of the concept of antibiotic use, its course and adverse

effects which can have important implications in the benefits and efficacy of a particular antibiotic for individual patients. When asked the reason why an antibiotic can have adverse effects, 10.2% believed the cause to be wrong diagnosis, 4.47% considered wrong dosage as the reason, 0.81% answered "wrong route", 0.4% thought drug interactions caused hazards, 2.84% believed drug reaction or hypersensitivity was responsible while majority (80.9%) respondents believed that all of the mentioned factors were included in the reasons. This was similar to the study conducted in Abbottabad, Pakistan where 15% believed inadequate knowledge of dose was a reason, 3% considered wrong medication, 6% thought drug interactions, 6.3% thought drug allergy was causative. However, unlike our study, only 26% believed all of the above factors responsible for side effects (7).

Analysis of the knowledge of respondents regarding the duration of course of antibiotic showed that 75.2% participants believed that it should be taken until the completion of course as advised by the doctor, 7.7% thought it should be taken for more than 7 days, 10.6% thought it should be less than 3 days and 6.5% were of the opinion that it should be taken until symptoms disappear. A similar study conducted in UAE showed that 74.9% continued antibiotic treatment until the completion of course, 22.2% continued until they felt better, 20% took the antibiotic for 1-3 days and 14.3% took it for more than 7 days (6).

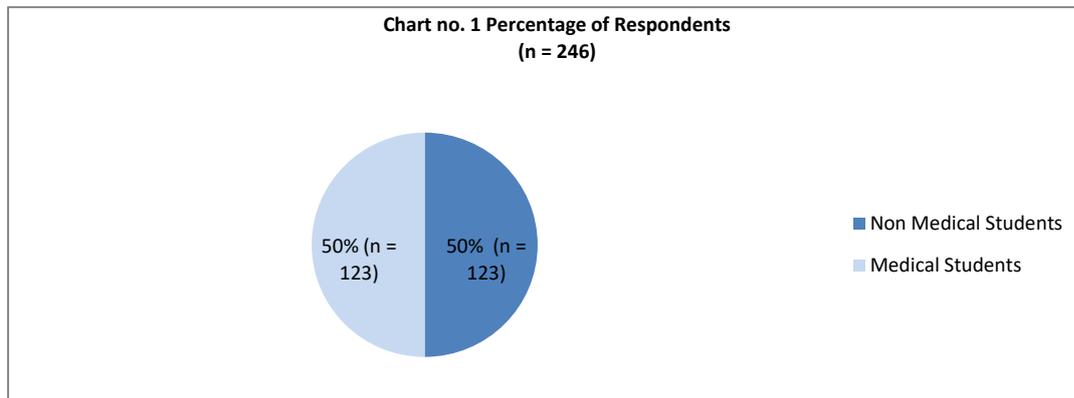
In case of experiencing adverse effects of an antibiotic, 84.6% respondents said they would consult a doctor, 10.6% would discontinue the antibiotic, 3.66% would switch to another antibiotic and 1.14% would continue taking it. The study in UAE showed similar results where 56.4% said they would consult a doctor, 47.6% would discontinue the use of that antibiotic, 4.4% said they would switch to another type and 5.4% reported that they would continue its use (6).

People prefer to obtain knowledge about antibiotics from different sources before starting a particular antibiotic therapy. Our study revealed that 61% obtained knowledge by consulting a doctor, 15% had previous experience, 9.3% checked the packet insert, 8.1% guessed the dose or checked the internet and 6.6% consulted a family member or friend. A similar study in Asmara, Eritrea showed that 46.9% consulted a professional, 28.5% used a previous prescription, 8.8% consulted friends/family, 5.3% used internet or mobile applications, while 10.1% guessed the dose (10).

From our study it is evident that people should be educated about the potential risks of self-medication of antibiotics and should always consult a doctor or pharmacy professional before starting a

particular antibiotic therapy since there are multiple factors that reduce the efficiency of the antibiotic or can lead to potential health hazards. These factors

can be minimized significantly by properly following the instructions of a health professional.



**Table 1 Knowledge of Respondents regarding Self-Medication of Antibiotics (n = 246)**

Statement	Yes	No
Have knowledge that self medication involves taking medicine without prescription or using an old prescription	88.2% (n=217) Medical students = 94.3% (n=116) Non medical Students = 82.11% (n=101)	11.8% (n= 29) Medical students = 5.69% (n=7) Non medical Students = 17.9% (n=22)
Have knowledge that self medication of antibiotics can lead to health hazards because of wrong diagnosis, route, drug reaction and interactions	93.5% (n= 230) Medical students = 98.3% (n=121) Non medical Students =88.6% (n=109)	6.5% (n=16) Medical students = 1.62% (n=2) Non medical Students = 11.4% (n=14)
Have adequate knowledge about dosage, timing and total days in the course before taking an antibiotic	77.2% (n=190) Medical students = 84.5% (n=104) Non medical Students = 69.9% (n=86)	22.8% (n=56) Medical students = 15.4% (n=19) Non medical Students = 30% (n=37)
Have adequate knowledge about the possible side effects before starting an antibiotic course	67.1% (n=165) Medical students = 79.6% (n=98) Non medical Students = 54.4% (n=67)	32.9% (n=81) Medical students = 20.3% (n=25) Non medical Students = 45.5% (n=56)
Have adequate knowledge about indications and contraindications of or hypersensitivity from that particular antibiotic before starting and antibiotic course	51.2% (n=126) Medical students = 61.7% (n=76) Non medical Students = 40.6% (n=50)	48.8% (n=120) Medical students = 38.2% (n=47) Non medical Students = 59.3% (n=73)

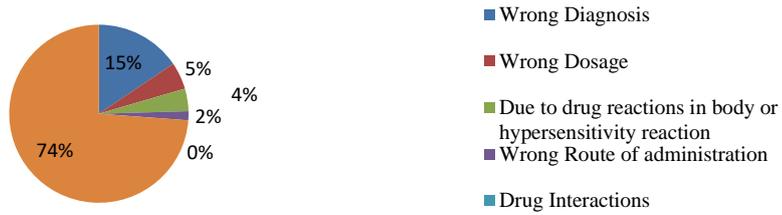
**Table 2 Attitude of Respondents regarding Self Medication of Antibiotics (n = 246)**

Statement	Agree	Disagree
Think that self medication of antibiotics is convenient, less costly and better than consulting the doctor each time	41.9% (n=103) Medical students = 38.2% (n=47) Non medical Students = 45.5% (n=56)	58.1% (n=143) Medical students = 61.7% (n=76) Non medical Students = 54.4% (n=67)
Think that it is okay to self medicate without a prescription, if the previous experience has had no adverse effect	35.8% (n= 88) Medical students = 35.7% (n=44) Non medical Students = 35.7%(n=44)	64.2% (n=158) Medical students = 64.22% (n=79) Non medical Students = 64.22% (n=79)
Trust their own or their family members' or friends' past experience regarding the dosage, timing and indications of the antibiotic more than the doctor's advice	23.3% (n=57) Medical students = 17% (n=21) Non medical Students = 29.2% (36)	76.8% (n=189) Medical students = 82.9% (n=102) Non medical Students = 70.7% (87)
Think that people should have access to antibiotics without prescription	19.9% (n=49) Medical students = 17% (n=21) Non medical Students = 22.7% (n=28)	80.1% (n=197) Medical students = 82.9% (n=102) Non medical Students = 77.2% (n=95)
Think that making strict regulation policies to limit public access to antibiotics without prescription, the best way to minimize self medication practice?	81.3% (n=200) Medical students = 91% (n=112) Non medical Students = 71.54% (n=88)	18.7% (n=46) Medical students = 8.9% (n=11) Non medical Students = 28.45% (n=35)

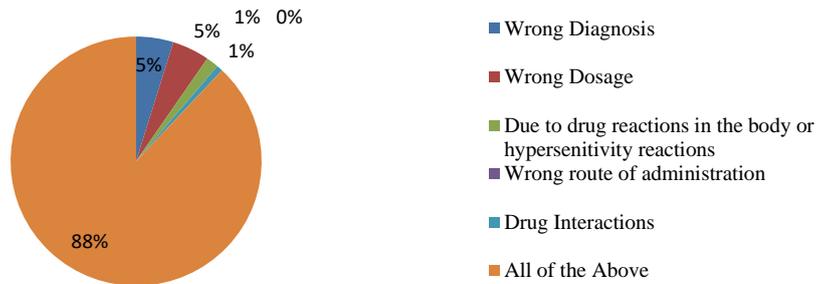
**Table 3 Practice of Respondents regarding Self Medication of Antibiotics (n = 246)**

Statement	Yes	No
Have taken an antibiotic without a doctor's prescription in the last 6 months	46.3% (n = 114) Medical students = 47.1% (n=58) Non medical Students = 45.5% (n=56)	53.7 (n = 132) Medical students = 52.8% (n=65) Non medical Students = 54.4% (n=67)
Always make sure to complete the full course of a particular antibiotic therapy	71.5% (n = 176) Medical students = 74.8% (n=92) Non medical Students = 68.3% (n=84)	28.5% (n= 70) Medical students = 25.2% (n=31) Non medical Students = 31.7 (n=39)
Have ever experienced any adverse effects during the course of any antibiotic therapy	33.3% (n = 82) Medical students = 28.4% (n=35) Non medical Students = 38.2% (n=47)	66.7% (n = 164) Medical students = 71.5% (n=88) Non medical Students = 61.8% (n=76)
Change the dosage of the antibiotic during the course of treatment	29.7% (n = 73) Medical students = 21.1% (n=26) Non medical Students = 38.2% (n=47)	70.3% (n = 173) Medical students = 78.8% (n=97) Non medical Students = 61.8% (n=76)
Check the expiry date of the antibiotic before using it	93.5% (n = 230) Medical students = 96% (n=118) Non medical Students = 91% (n=112)	6.5% (n = 16) Medical students = 4% (n=5) Non medical Students = 9% (n=11)

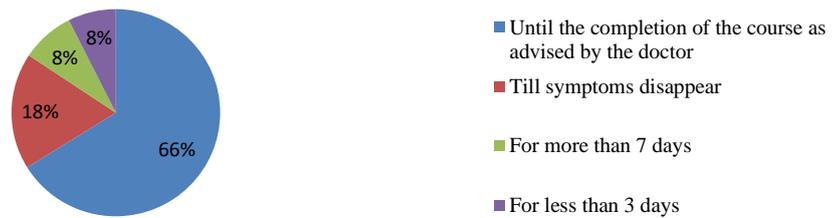
**Chart No. 2 Perception of Non Medical Students regarding the Reason for Health Hazards Caused By Self Medication**



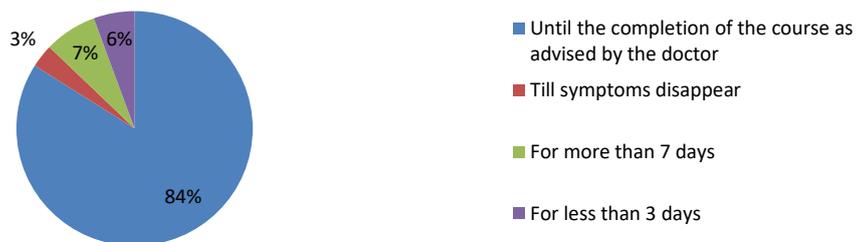
**Chart No. 3 Perception of Medical Students regarding the Reason for Health Hazards Caused By Self Medication**



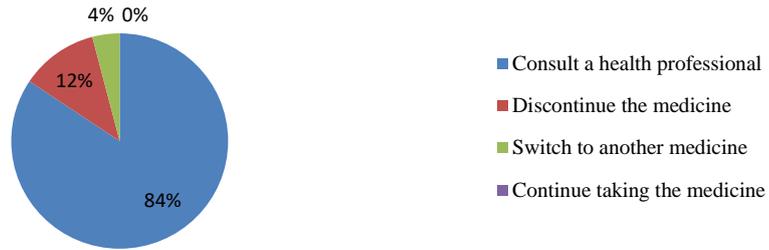
**Chart No. 4 Perception of Non Medical Students regarding how long should an antibiotic be taken for**



**Chart No. 5 Perception of Medical Students regarding how long should an antibiotic be taken for.**



**Chart No. 6 Perception of Non Medical Students Regarding What Would They Do if They Experienced any Adverse Effects During the Course of the Antibiotic**



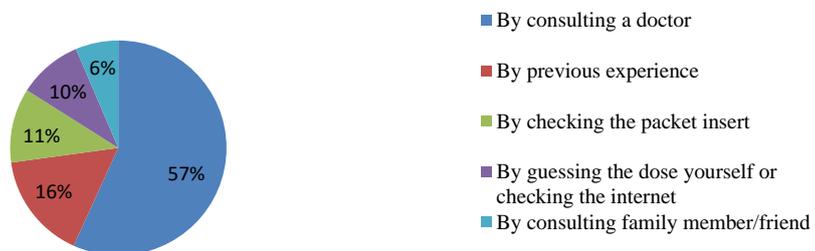
**Chart No. 7 Perception Of Medical Students Regarding What Would They Do if They Experienced Any Adverse Effects During The Course Of The Antibiotic**



**Chart No 8. Perception of Non Medical students regarding source of their knowledge and information about an antibiotic**



**Chart No 9. Perception of Medical students regarding the source of their knowledge and information about an antibiotic**



**CONCLUSION:**

Most of the participants had adequate knowledge, good perception and negative attitude regarding the self-medication of antibiotics. However, the prevalent practice among a significant proportion of participants shows that strict regulation of the sale of antibiotics without prescription and awareness among people is necessary to prevent self-medication practice in the community.

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### Annexure

Name:

Age:

Gender:

Field of Education:

- Medical/ Non Medical

1. Do you know self medication involves procuring medicine without prescription or using old prescription?  
Yes/No
2. Do you know that self medication of antibiotics can lead to health hazards because of wrong diagnosis, route, drug reactions and interactions?  
Yes/No
3. When you start taking an antibiotic, do you have adequate knowledge regarding dosage, timing and total days in the course?  
Yes/No
4. Before starting an antibiotic therapy, do you have adequate knowledge about possible side effects?  
Yes/No
5. Before starting an antibiotic therapy, do you have adequate knowledge about indications and contraindications of or hypersensitivity to that particular antibiotic?  
Yes/No
6. Do you think self medication is convenient, low cost and better than consulting the doctor each time?  
Yes/No
7. Do you think it is okay to self medicate without a prescription if the previous experience had no adverse effects?  
Yes/No
8. Do you trust your own or your family members' or friends' past experience regarding dosage, timing and indications of the antibiotic more than the doctor's advice?  
Yes/No
9. Do you think people should have access to antibiotics without prescription?  
Yes/No
10. Do you think making strict regulations to limit public access to antibiotics without prescription, the best way to minimize self medication practice?  
Yes/No
11. Have you taken an antibiotic without a doctor's prescription in the last 6 months?  
Yes/No
12. Do you always make sure to complete the full course of a particular antibiotic therapy?  
Yes/No
13. Have you ever experienced any adverse effects during the course of any antibiotic therapy?  
Yes/No
14. Do you change the dosage of antibiotic during the course of treatment?  
Yes/No
15. Do you check the expiry date of antibiotic before using it?  
Yes/No
16. Self medication can lead to health hazards because of:
  1. Wrong diagnosis
  2. Wrong dosage
  3. Wrong route of administration
  4. Drug interactions
  5. Drug reaction or hypersensitivity

6. All of the above
17. According to your knowledge, how long should you take an antibiotic for?
  1. For more than 7 days
  2. For less than 3 days
  3. Till symptoms disappear
  4. Until the completion of course as advised by the doctor
18. What would you do if you faced adverse effects during the course of an antibiotic?
  1. Discontinue the antibiotic
  2. Switch to another antibiotic
  3. Continue taking the medicine
  4. Consult a health professional
19. How do you know about the dosage of antibiotic and what is your source of information regarding a particular antibiotic?
  1. By checking the packet insert
  2. By consulting a family member/friend
  3. By consulting a doctor
  4. By previous experience
5. By guessing the dose or by checking the internet etc.