A COMPARATIVE STUDY OF SELF-MEDICATION PRACTICE AMONG MEDICAL & ENGINEERING STUDENTS IN A PRIVATE UNIVERSITY IN NORTH INDIA.

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ABSTRACT
This study was undertaken to determine the knowledge, attitude & practice of self medication among Medical & Engineering students of all the years of NIMS Medical & Engineering College, Jaipur, Rajasthan. This study was an anonymous, questionnaire-based, descriptive study. A self-developed, pre-validated questionnaire consisting of both open-ended and close-ended questions was filled by all year Medical & Engineering students. Data was reviewed, organized and summarized as counts and percentages and evaluated using the Chi-square test and p-value of <0.05 was considered statistically significant. Out of total 316 students in medical and 346 in engineering, with an age range from 17-27 years. Out of these, 73.4% medical & 75.7% engineering students had taken self medication. The commonest indications for self-medication were headache & fever followed by cough/common cold. 37.4% of the engineering students didn’t feel the need to go to a doctor while minor illness (62.5%) among medical students and these were the most frequent reasons for resorting to self-medication and the main source of self medication was guardians (54.9%) while it was previous experience in 34.9% of medical students. Analgesics were the commonest drugs used followed by antimicrobials with 70.2% (medical), 52%(engineering) of the students completed the recommended course of antimicrobials. The practice of self-medication in our study was common and often inappropriate and this high
prevalence is a cause of concern. Education and proper information about the drugs may go a long way in promoting responsible self medication.

**Keywords:** Self-medication, medical students, engineering students, self-prescription.

**INTRODUCTION**

Self-medication can be defined as obtaining and consuming drugs without the advice of a physician either for diagnosis, treatment or monitoring of treatment \(^1\). As one element of self-care \(^2\), self medication is known to be practiced by world population \(^3\). Throughout the ages, people have sought solutions and answers to medical problems through self-medication that is, through treating themselves. Today, as well, many are often quick to treat their ailments without professional help. In an American study it is stipulated that in about 60 percent of the time this self-treatment involves over-the-counter (OTC) medications.\(^4\) One study indicated that more than 60% of the reported illnesses were self medicated with the use of OTC drugs \(^5\). Another survey pointed out that, even with a professional health care supervision, it was reported up to 80% of the patients were still self medicated with modern medication \(^6\), and self medication accounts for approximately 20% of the total international pharmaceutical market \(^7\). Although, over the counter drugs (OTC) are meant for self medication and are of proven efficacy and safety, their improper use due to lack of knowledge of their side effects and interactions could have serious implications, especially in extremes of ages (children and old age) and special physiological conditions like pregnancy and lactation.\(^8,9\) It is now believed that self medication is one of the most essential components of health care not just in developed countries but as well as in developing countries.\(^10\) Doctors & medical students are more prone to self-medication due to their familiarity with medicines. As their knowledge & familiarity with medicines increases, it is expected that their practice of self-medication will also increase. A high level of education and professional status has also been mentioned as predictive factor for self medication.\(^11\) Despite this, there is a paucity of comparative studies on self-medication among medical and engineering students therefore the present study was undertaken to determine and compare the knowledge, attitude and practice of self-medication, to identify the reasons for, the patterns of self medication, to know the prevalence of self medication and to find out the incidence of adverse drugs reactions among all the four year medical and engineering students of NIMS medical college and NIMS College of Engineering and Technology, Jaipur, Rajasthan.
MATERIALS AND METHODS
This study was an anonymous, questionnaire-based survey undertaken to assess the knowledge, attitude & practice of self medication among M.B.B.S and Engineering students of all the years in NIMS Medical College, Jaipur, Rajasthan (India). A self-developed, pre-validated questionnaire consisting of both open-ended and close-ended items was used. A cross section of medical and engineering students of 1st, 2nd, 3rd, and 4th year were taken. The pattern of drug use over a six-month period preceding the study was noted. A total of 16 questions (annexure 1) were stated concerning the following: Socio-demographic characteristics (like age, sex), knowledge & attitude towards self medication, patterns of self–medication, especially with antimicrobials (e.g. type of antimicrobials used, frequency, whether the course of antibiotic was completed.) etc. were included. All the students who were willing to participate in the study were enrolled. A briefing was given about the nature of the study, and the procedure of completing the questionnaire was explained. Consenting participants anonymously completed the questionnaire in the classroom. The survey was descriptive & after completion of data collection it was reviewed, organized and data was summarized as counts and percentages and evaluated using the Chi-square test and p-value of <0.05 was considered statistically significant. Some of the questions had multiple options to choose from therefore the sum total of percentage is not always 100%.

RESULTS
Baseline characteristics
A total of 320 medical students and 370 engineering students were present at the time the questionnaire was administered. All the students responded to questionnaire but 4 students in medical and 24 students from engineering were excluded due to submission of incomplete questionnaire. Thus, 316 students in medical and 346 in engineering were eligible for the study. The nationality of the subjects was Indian. Of the medical students 163(51.5%) were male & 153(48.4%) were females and among the non medical engineering students 244 (70.5%) were male and 102 (29.4%) were females. Their age ranged from 17-27 years in medical and 17-25 in engineering student.

Prevalence of self medication in males and females (%)
Out of the 316 medical students 232 (73.4%) had taken self medication & 84 (27.6%) were not taking self medication in the past 6 months. Comparing the sex wise variation of self medication rate, out of a total 153 females, 124(81%) were taking self medication; while for
males out of a total of 163 males 108(66%) were taking self medication. This difference is statistically highly significant with P value <0.0029. Out of the 346 engineering students 262 (75.7%) had taken self medication & 84 (24.2%) had not self medication in the past 6 months, out of a total 102 females, 58(56.8%) were taking self medication; while for males out of a total of 244 males 204(77.8%) were taking self medication also showing a statistically highly significant ratio with P value <0.001.

When we studied the consumption of drugs among medical students a total of 523 drugs were consumed by 232 students over a period of six months. The average number of drugs consumed per student in a 6 months period was 2.254. The most common drugs used were analgesics-antipyretics 229(43.78%), followed by antimicrobials 111(21.22%), as depicted in detail in figure 1.

### Antimicrobials

There were 111 (21.22%) antimicrobials consumed in total by all the year students, with Azithromycin having the maximal consumption of 54(48.64%), followed by Amoxicillin 20(18.01%) & Ciprofloxacin 19(17.11%). The use of antimicrobials increased from 1st year to final year & the difference was highly significant (p < 0.0001). Students who took antibiotic therapy & completed the course increased from 4(50%) out of eight students who took antimicrobials in 1st year to 34(77.2%) students out of 44 in the final year & the percentage of students who did not complete the course decreased from 4(50%) in first year to 10(22.7%) in the final year.

262 engineering consumed 623 drugs students over a period of six months with an average of 2.37 drugs consumed per student. The most common drugs used were analgesics-antipyretics 352(56.5%), followed by antimicrobials 97(15.6) which have been shown in detail in figure. There were 97(15.6%) antimicrobials consumed in total by all the year students, with macrolides & fluoroquinolones preferred as antimicrobials among engineering undergraduates. In total 78 out of 111(70.2%) medical students and 51 out of 97(53%) engineering students completed the course as shown in figure 2.

To our surprise the finding regarding the p- value among medical as well as engineering student was same as there was no significant difference (p > 0.05) in all the years based on completing and not completing the course

Paracetamol alone or in combination was the most commonly used drug by both medical and
non medical students.

**KNOWLEDGE**
Of the total 316 students, 128 (40.5%) students thought that self medication was while it was greater in percentage among engineering students 161(46.56%) & but less percentage of engineering students 185(53.4%) thought that they should go to the doctor for illness whereas 186(58.86%) of medical students thought that they should go to a doctor for illness.

Of the 232 medical students who took self medication 152(65.5%) had knowledge about dose, side effects & interactions of the drugs they took. Among engineering students this rate was lower to 153(58.3%). This showed a progressive increase from 12.7% in 1st year to 49.1% in 2nd year to 90.7% in 3rd year & 96% in 4th year in medical students, while in non medical engineering students there was no fixed pattern of variations among different year students, clearly highlighting the influence of medical education among medical students.

**Main symptoms of illness**
The main symptoms of illness among medical undergraduates were headache seen in 118(50.86%) students followed by cough/common cold in 65(28%), sore throat in 64(27.5%), fever in 57(24.5%) & weakness/body pain in 26(11.2%) students while engineering students most commonly complained of fever in 176(67.1%) of the students followed by, cough/common cold 104(39.69%), headache 84(32.061%) & body pain 54(20.6%).

**Main reason for not going to the doctor (Table 1 )**
The most common reason for not going to the doctor among students of medical and engineering faculty is as shown in detail in the following table with majority (62.5%) of medical students thought it to be a minor illness while 37.4% of the engineering students didn’t feel the need to go to a doctor which may be hazardous for both the students of both the streams.

**Source of information**
Among the medical students who took self medication, the main source was previous experience in 34.91% of medical students while it was guardians (54.9%) in engineering students(figure-3). Interestingly, seniors were only a minor source of information for both the professional students.
Adverse drug reactions
11.2% medical students had reported ADR while the number ADR reported amongst engineering students was higher (29.77%). Nausea & vomiting, stomach pain, & sedation were the most common ADRs reported while Sedation, itching, redness were the most common ADRs reported among engineering students.

Table 1: Reasons For Not Going To The Doctor:

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total medical (%)</th>
<th>Total engineering(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn’t feel the need</td>
<td>15 (6.46%)</td>
<td>98(37.4%)</td>
</tr>
<tr>
<td>Minor illness</td>
<td>145 (62.5%)</td>
<td>97(37.02%)</td>
</tr>
<tr>
<td>Treatment, advised by guardians/seniors/known person</td>
<td>21 (9.05%)</td>
<td>95(37.2%)</td>
</tr>
<tr>
<td>Previous experience/ already knew he treatment</td>
<td>32 (13.79%)</td>
<td>81(30.9%)</td>
</tr>
<tr>
<td>Time constraints/ Late night</td>
<td>13 (4.31%)</td>
<td>31(11.8%)</td>
</tr>
<tr>
<td>Far place</td>
<td>09 (3.87%)</td>
<td>11(4.1%)</td>
</tr>
<tr>
<td>Doctor not available</td>
<td>-</td>
<td>10(3.81%)</td>
</tr>
<tr>
<td>Money constraints</td>
<td>08 (3.44%)</td>
<td>10(3.81%)</td>
</tr>
</tbody>
</table>

Annexure 1:
Questionnaire used for assessing prevalence of self and non-doctor prescribing
1) What is your name?
2) What is your full residential address?
3) What is your approximate monthly salary/pocket money/income of family?
4) Have you used medicines of your own without consulting either a doctor in the preceding six months: Yes/No
5) How many episodes of illness have you had in the preceding six months?
6) What was the main symptom of your illness?
7) What others symptoms did you experience?
8) Were there any associated complaints?
9) What type of medicine(s) did you use?
10) Can you tell me it’s (their) name(s)?
11) If you took antimicrobials then did you complete the course: Yes/No
12) Did you have knowledge about dose, side effects, interactions, of the medicines you have taken? Yes/no.
13) What was the main source of information of your self medication: Friends/Chemists/Advertisement/Seniors/Books/Previous prescriptions/Previous experience/Guardian.

14) What was your main reason for not consulting a doctor: Minor illness, Far place, Money constraints, Time constraints/Late night, Didn’t feel the need, Doctor not available, Some known doctor, Previous experience, treatment advised by guardian/senior

15) Do you think self medication is harmful: Yes/No

16) Did you find any Adverse Drug reaction & what was the most common ADR.

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**Figure 1:** Pattern of drug usage among medical and engineering students

![Pattern of Drug usage among Medical & Engineering students](image1)

**Figure 2:** Elaborating comparison of completion and non completion of antibiotic course among medical and engineering students.

![Completed or not completed the course of antibiotics](image2)
DISCUSSION

Prevalence
In our study of the total 316 M.B.B.S & 346 engineering students of all the 4 years were studied of which 51.5% were male & 48.4% were females among medical and 70.5% were male & 29.4% were females among engineering students, out of these 73.4% medical students and 75.7% engineering students were taking self medication which is nearly equal and shows a increased knowledge and use of medicines among non medical persons like engineering students as found in our study. In comparison to our study, prevalence of self medication among general population ranges from 59 - 90% [12-14] while the prevalence of self medication among university students ranges from 38.5 %– 92%. [13-18] Among medical students a recent study in South India showed a self medication rate of 92% [15], while similar studies among medical students in other countries have shown self medication rates ranging from 45-55% [16,19] and similar studies among non medical university students have shown self medication rates ranging from 65%[20] to 87%. [14] Self medication rates were higher among females(81%) in medical students whereas they were higher in males(77.86%) among engineering undergraduates. In comparison a study among medical students in India showed higher prevalence of self medication among males, while another study done in Bahrain showed a slightly higher prevalence of self medication in females[15,19]

Knowledge & attitude
In our study 40.5% of the students of medical thought that self medication is harmful while 46.56% of the engineering students perceived self medication as harmful. 65.5% medical and 58.3% engineering students had knowledge about dose, side effects, and interactions inspite
of having non medical background. In a study among non medical university students in Punjab,[21] 43.4% had knowledge about drug interactions and 32.7% had knowledge about drug profiles. High rates of knowledge about dose, side effects and drug interactions among the people with technical, non medical background has shown an increasing trend of use of internet to find out about diseases and their treatment.

Common indication

The most common indications among the students of both medical and non medical background for self-medication were fever, headache, cough/common cold this was in accordance to studies done earlier [13-17, 19, 22]. The main source of self medication in our study among medical students was previous experience (34.91%), followed by books (33.18%) whereas guardians were the main source of information for self-medication(54.9%) followed by previous experience (43.5%) and friends (29%) in non medical engineering students. In a study on medical students books and seniors tend to be the most common source of information [17], while in non medical students of Udaipur friends and family members [20] were the major source which coincides with our study. A different scenario was seen in a study on general population in which chemists were the major source followed by friends and advertisements.[22] This shows that guardians and friends play a major role in influencing the self medication patterns in college students. The main reason for not going to the doctor among medical students was minor illness (62.5%) and among engineering students was that they didn’t feel the need to consult a doctor (37.4%) followed closely by minor illness and treatment advised to the students by others, this was in accordance to previous studies [13, 16, 22], whereas time saving and minor illness in a study [14] and time saving and high consultation fee [23] in other studies.

Drugs

(a) Analgesics

Analgesics have been reported to be the most commonly used group of drugs among medical and non medical population [12, 15-17, 19, 22]. Our study also found similar results. Among the analgesics, Paracetamol, alone or in combination was the most commonly used drug. This correlates well with fever & headache being the most common indication for self medication among students of both the streams.

(b) Antimicrobials

In our study 21.22% of medical and 15.62% of engineering students used antimicrobials and
Azithromycin was the most commonly used antibiotic. Upper respiratory tract infection is one of the most common infections and Azithromycin is a very effective drug for these infections. General population showed antimicrobials use to be 11% [22]. This was comparatively higher. In one Iranian study, less medical students compared to nonmedical ones (42.2% vs. 48%) practiced antibiotic self-medication [24]. Interestingly, only 4.8% students at Gondar College of Medicine and Health Sciences in Ethiopia used antimicrobials while doing self-medication [16]. Most of the studies among medical people showed penicillin and among them Amoxicillin as the main group of antimicrobials. In our study 70.2% medical respondents and 52% of the engineering students completed the course of antimicrobials. In comparison other studies have reported rates as low as 26.8% & 37.6% [25-26].

**Adverse drug reactions (ADRs)**

29.77% students reported adverse drug reactions in our study which was higher than the ADRs reported among medical students (11.2%), this may be attributed to the better knowledge of drugs and their adverse effects among medical students. No serious ADRs were reported. Sedation, Vomiting, stomach pain, nausea, itching, redness were the most common ADRs reported among both students of both the streams. High rates of self medication in our study is a cause of concern. Education and proper information about the drugs will promote responsible self medication. Education, proper information & awareness on the use of drugs along with enforcing restrictions on the sale of drugs will help to promote responsible self medication. Thus, to avoid or minimize the dangers of self medication, the students should be educated about the dangers of indiscriminate use of drugs and also physicians should be more judicious in prescribing and should insist on drugs being supplied by the chemist only on a valid prescription. A proper statutory drug control must be implemented, which restricts the availability of drugs to the general public.

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**CONFLICTS OF INTEREST**

The authors declare that they have no competing interests.

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