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Original Article

Pharmacology Section

Knowledge, Attitude and Practice of Self-Medication Among Basic Science Undergraduate Medical Students in a Medical School in Western Nepal

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ABSTRACT

Introduction: Studies have shown self-medication to be common among medical students. These studies are however, few in Nepal. The present study assessed knowledge, attitude, and practice of self-medication among second and fourth semesters' undergraduate medical students and studied differences in knowledge and attitude (if any) among different subgroups of the respondents.

Materials and Methods: A cross-sectional survey was conducted using a questionnaire among basic science medical students of Manipal College of Medical Sciences, Nepal. Semester of study, gender, age, nationality, and the profession of their parents were noted. Students' knowledge and attitude about self-medication was studied by noting their degree of agreement with a set of 40 statements using a Likert-type scale. The average scores and frequency of occurrence of particular behaviors among different categories of respondents were compared using appropriate statistical tests.

Results: Two hundred and seventy-six of the 295 (93.6%) students participated. The mean (SD) knowledge, attitude, and total scores were 74.54 (6.92), 67.18 (5.68), and 141.73 (10.76) with maximum possible scores 100, 100 and 200, respectively. There was no significant difference in scores according to respondents' gender, age, and the profession of their parents. However, the mean knowledge, attitude and total scores were significantly different among students of different nationalities. Mean scores of fourth semester students were significantly higher compared to second semester students. There were differences in knowledge and total scores among students of different nationalities. Eighty two percent of respondents had self-medicated during the one year period preceding the study; 149 respondents (54%) shared that previous experience with the medicine was one of the information sources for self-medication. Prevalence of self-medication among respondents according to semester of study, gender, age, and profession of the parents was not significantly different. The use of self-medication was more common among Sri Lankan respondents compared to Nepalese. Painkillers (73.2%), antipyretics (68.8%), and antimicrobials (56.2%) were most commonly used for self-medication.

Conclusion: Students' knowledge and attitude about self-medication is good. The prevalence of self-medication among medical students was high.

Keywords: Responsible self-medication, Self-care

INTRODUCTION

Self-medication, an integral and vital component of self-care, is defined as "selection and use of medicines/medicinal products including herbal and traditional products by individuals to treat self-recognized illness or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring diseases or symptoms" [1]. Although self-medication is practiced worldwide [1,2], the incidence may be higher in developing countries [3].

Self-medication is affected by various factors some of them being socioeconomic (e.g. educational level, socioeconomic status, access to medical information, awareness about health etc), accessibility to medicine and health care facilities, health sector reforms among others [2]. Improvement in peoples' general knowledge, level of education, socioeconomic status, and development of new technologies (e.g. internet and related communication) is promoting self-medication worldwide [1]. Responsible self-medication has been advocated by the World Health Organization (WHO) for the treatment and prevention of condition/symptoms that do not require medical consultation. It is a cheaper alternative for treating common illnesses and may be important in countries like Nepal where access to medical services are difficult and there is a shortage of medical personnel especially in rural areas [4]. However, the practice of self-medication should be supported by unbiased medical information provided to patients to avoid health hazards [2].

Self-medication has both benefits and risks. Responsible self-medication can save scarce medical resources from being wasted on minor conditions, reduce the burden on health care facilities, and decrease the cost and time people spend to visit health care facilities for minor symptoms [1,5]. However, inappropriate self-medication can have a number of potential risks for example delay in seeking appropriate medical advice; failure to recognize or self-diagnose contraindications, interactions with prescribed medicinal products; failure to report current self-medications to the prescribing physician (risk of double medication and/or harmful interaction); inappropriate duration of use of medicine; risk of dependence and abuse etc [1].

In Nepal, access to health care services is difficult and/or expensive. So self-medication may provide an easier and cost-effective option [3]. Furthermore, in Nepal like in many other developing countries, even prescription only medicines are dispensed by non-medical personnel at medical stores without a prescription. The public may prefer the medical store as their source of medicine as the waiting time may be less, medical stores may be present nearer to their place of residence and the process is less expensive as the public can avoid paying consultation and other charges [3,6]. Herbs

and herbal medicines are also commonly used for self-medication because of their easy availability and accessibility; people have some knowledge about herbal remedies, and hold the perception that herbal products are safe and devoid of side-effects [3].

Medical students during their undergraduate years of study are not legally eligible to prescribe medicines despite their increasing knowledge about the pathophysiology of diseases and therapeutics. Thus they may be in a unique situation with regard to self-medication. Recent studies have shown self-medication to be common among medical students and the incidence was high in medical colleges of South India (92%) [7], Karachi (76%) [8] and Egypt (55%) [9]. Self-medication among medical students may be more because they are empowered with good educational level, greater access to medicine and information, and knowledge of diseases [2,10]. The medical student should have good knowledge about self-medication so that they can practice responsible self-medication. [Table/Fig-1] compares few research articles conducted in India and Nepal on self-medication among medical and paramedical students.

Self-medication is unavoidable in certain circumstances so the public should be motivated to practice responsible self-medication [4]. Medical students, future doctors and medical educators, with good knowledge about self-medication could advocate, motivate, and impart essential knowledge to their patients and the general public for responsible self-medication. Furthermore, doctors should be knowledgeable about the self-medication practice in the community so that they could enquire about self-medication by their patients before prescribing medicines. This could help them optimize therapy and avoid drug-drug interactions.

Manipal College of Medical Sciences (MCOMS), Pokhara, Nepal is the first private medical school in Nepal and admits 150 students annually mainly from Nepal, India, Sri Lanka, and Maldives to the undergraduate medical (Bachelor of Medicine and Bachelor of Surgery, MBBS) course. The course is divided into two years (four semesters) of integrated basic sciences, two and half years of clinical sciences, and one year compulsory residential rotating internship. During the integrated basic sciences the six subjects (Anatomy, Biochemistry, Microbiology, Pathology, Pharmacology and Physiology) are taught in an integrated organ system-based manner along with Community Medicine and Introduction to Clinical Medicine (ICM). A hybrid approach of didactic lectures, problem based learning (PBL), and practical sessions are used [11]. There is a paucity of studies on self-medication among basic science medical students in Nepal. Hence the study was planned with the following objectives: 1) to assess the knowledge, attitude, and practice of self-medication among second and fourth semester basic science undergraduate medical students; and 2) to study differences in knowledge and attitude (if any) among different subgroups of the respondents.

MATERIALS AND METHODS

A cross-sectional survey was carried out among second and fourth semester MBBS students of MCOMS willing to participate. As the students had completed two and four semesters of integrated basic sciences, they were knowledgeable about common medicines used for self-medication like non-steroidal anti-inflammatory drugs (NSAIDs), anti-histaminic (anti-allergic) agents, antibiotics, etc.

The study was carried out from the last week of July to the first week of August 2015 using a questionnaire (shown as an additional file). The questionnaire consisted of three parts. The first part obtained demographic data of the respondents e.g. age, gender, nationality, semester of study, location of their home town (e.g. urban or rural), and occupation of their parents (father and mother). The second part of the questionnaire contained 40 statements to measure respondents' knowledge and attitude about self-medication. The students were asked to provide a score (1 to 5) according to their degree of agreement with the statements according to the scale 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree. Twenty statements (statement no. 1, 3-6, 9, 11-14, 18, 20, 24, 28, 29, 31, 36, and 38-40) measured knowledge while the remaining 20 statements measured attitude. The third part of the questionnaire included few questions to study the practice of self-medication and source of information used by the respondents while practicing self-medication.

The questionnaire was developed by the authors after an extensive review of literature. The questionnaire was circulated among a group of faculty members at MCOMS, Pokhara for their inputs regarding validity of the statements and their ease of comprehension. The questionnaire was tested for ease of comprehension and readability among six clinical students of the institution. Their data was not included in the final analysis. Cronbach's alpha was calculated as a measure of internal validity of the questionnaire.

STATISTICAL ANALYSIS

The collected data were entered into and analysed using SPSS (Statistical Package for the Social Sciences) version 20 for windows. To avoid bias, certain statements (statement numbers 8, 11, 17, 19, and 27) were negatively worded and their scores were reversed while calculating the total and subscale scores. The normality of distribution of the total, knowledge, and attitude scores was studied using one sample Kolmogorov-Smirnov test (p-value of 0.05). The average scores and their dispersion were compared among different categories of respondents using appropriate statistical tests. The

	Authors (in chronological order)				
	Sontakke et al., [12]	Badiger et al., [7]	Pandya et al., [13]	Patil et al., [14]	Mehta et al., [10]
Place	Nagpur, India	Mangalore, India	Ahmedabad, India	Karnataka, India	Chitwan, Nepal
Study aim	Compare the pattern of self-medication among I and III year medical students; Evaluate whether medical training results in any change.	Determine the reasons and patterns for self-medication.	Prevalence and pattern of use of self-medication.	To study practice and perception about self-medication	Knowledge, attitude and behavior of self-medication by medical students
Study design & population (Sample size)	Cross sectional; first and third year medical students (n=337)	Cross sectional; all undergraduate medical students (n=200)	Cross sectional; all undergraduate medical students (n=685)	Cross sectional; all undergraduate medical students (n=440)	Cross sectional; first year medical and paramedical students (n=75)
Self-medication incidence	76.26% (77.98% I year & 74.71% III year students).	92%	82.3% in last one year	88.18% in last 6 months	84% in last one year
Important findings	Senior students have better knowledge than juniors but the juniors were also well aware about self-medication.	Self-medication is facilitated by the easy availability of drugs and information. A significant number of students are unaware of the adverse effects of self-medication.	Self-medication practice changed with time and increasing knowledge and was highest among the interns.	Self-medication was practiced widely. Antibiotics, Antipyretics and Analgesics were most commonly used for self-medication.	Self-medication was very common, respondents have good knowledge and positive attitude towards self-medication. Analgesic and antipyretic were most commonly used drugs.

[Table/Fig-1]: Summary comparison of previously published articles on self-medication among medical and paramedical students in India and Nepal

frequency of prevalence of self-medication among respondents grouped according to demographic characteristics was compared using chi-square test. A p-value of less than 0.05 was taken as statistically significant. Free text comments about self-medication were noted and common ones tabulated.

The study was approved by the Institutional Review Committee (IRC), MCOMS, Pokhara vide notification MEMG/IRC/GA (i). The students were invited to participate and informed about the objectives and importance of the study. It was clarified that participation was voluntary and they could withdraw from the study at any time without giving any reason. They were assured about the confidentiality of their identity and had the opportunity to answer all questions honestly. Written informed consent was obtained from all the respondents prior to administering the questionnaire.

RESULTS

Two hundred and seventy six of the 295 (93.6%) second and fourth semester students participated in the study. More number of respondents were female, of Nepalese nationality, and of age 20 years [Table/Fig-2]. The mean (±SD) age of the respondents was 20.16 (±1.24) years. [Table/Fig-2] shows the demographic characteristics of the respondents.

The Cronbach's alpha value for the questionnaire was 0.712 indicating a good level of internal consistency. The one sample Kolmogorov-Smirnov test showed the total, knowledge and attitude scores were normally distributed. Hence mean was used as the measure of central tendency and standard deviation as the measure of variation. The mean scores were compared among different subgroups of respondents using appropriate statistical tests. Independent samples t-test was used for dichotomous variables and analysis of variance (ANOVA) for others. A p-value less than 0.05 were taken as statistically significant. Tukey HSD test was used as the Post-hoc test for pair wise comparison if ANOVA showed a significant difference.

The mean (SD) knowledge, attitude, and total scores were 74.54 (6.92), 67.18 (5.68), and 141.73 (10.76), respectively. The maximum values for knowledge and attitudes were 100 and the maximum possible total score was 200.

[Table/Fig-3] shows the knowledge scores according to respondents' personal characteristics. There was no significant difference in scores according to respondents' gender, age, and the profession of their parents. However, the differences in mean score according to respondents' semester of study and nationality were statistically significant. The mean scores of fourth semester students were significantly higher compared to second semester students. With regard to nationality post-hoc test showed that the mean knowledge score of Nepalese respondents (75.4) was significantly (p=0.008) higher compared to Indians (72.0) and the mean knowledge score of other country respondents (76.6) was significantly (p=0.033) higher compared to Indian respondents (72.0).

[Table/Fig-4] shows the attitude scores according to respondents' personal characteristics. There was no significant difference in the attitude scores according to the respondents' gender, age, and the profession of their parents. However, the mean score according to respondents' semester of study, and nationality was statistically significant. Post-hoc test showed that the mean attitude score of Nepalese respondents (68.3) was significantly (p=0.001) higher compared to Indian respondents (65.1). [Table/Fig-5] shows the total scores according to respondents' personal characteristics. Significant differences in the mean (SD) total scores of the respondents were found (one-way ANOVA and Post-hoc tests) between Nepalese and Indian respondents (p<0.001) and between Indian and other country respondents (p=0.017). The mean (SD) total scores of respondents from Nepal and other countries were 143.7 (11.2) and 144.8 (9.0), respectively, which was significantly higher

Characters	Frequency (%)
Semester of study	
Second	145 (52.5)
Fourth	131 (47.5)
Gender	
Female	158 (57.2)
Male	118 (42.8)
Age (in years)	
18	21 (7.6)
19	64 (23.2)
20	96 (34.8)
21	51 (18.5)
22	36 (13.0)
23	7 (2.5)
25	1 (0.4)
Nationality	
Nepalese	133 (48.2)
Indian	63 (22.8)
Sri Lankan	58 (21.0)
Other	22 (8.0)
Family Home	
Urban	237 (85.9)
Rural	39 (14.1)
Fathers' Profession	
Medical	72 (26.1)
Non-medical	203 (73.5)
No response	1 (0.4)
Mothers' Profession	
Medical	42 (15.2)
Non-medical	96 (34.8)
House wife	137 (49.6)
No response	1 (0.4)

[Table/Fig-2]: Demographic characteristics of respondents

Characters	Mean (SD) Maximum score 100	p-value
Semester of study		
Second	73.7 (6.9)	0.037
Fourth	75.5 (6.9)	
Gender		
Female	74.2 (6.9)	0.345
Male	75.0 (7.0)	
Age (in years)		
18	72.2 (6.3)	0.448
19	74.2 (6.7)	
20	74.2 (7.0)	
21	75.5 (7.2)	
22	76.0 (7.3)	
23	75.6 (5.5)	
Nationality		
Nepalese	75.4 (7.1)	0.006*
Indian	72.0 (7.5)	
Sri Lankan	74.6 (5.7)	
Other	76.6 (5.2)	
Fathers' Profession		
Medical	74.0 (7.4)	0.490
Non-medical	74.7 (6.8)	
Mothers' Profession		
Medical	74.0 (6.3)	0.755
Non-medical	74.3 (7.2)	
House wife	74.8 (7.0)	

[Table/Fig-3]: Mean knowledge scores according to demographic characteristics of respondents.
*ANOVA test showed that there was a significant difference between groups (p<0.05) so Post-hoc Tukey's HSD test was performed and the mean score of Nepalese respondents' was significantly (p=0.008) higher compared to Indians; and the score of other countries respondents was significantly (p=0.033) higher compared to Indians.

Characters	Mean (SD) Maximum score 100	p-value
Semester of study		
Second	66.3 (5.4)	0.009
Fourth	68.1 (5.8)	
Gender		
Female	67.5 (5.5)	0.268
Male	66.7 (5.9)	
Age (in years)		
18	66.1 (6.4)	0.334
19	67.1 (5.3)	
20	67.5 (6.0)	
21	67.6 (5.4)	
22	65.9 (5.4)	
23	71.1 (4.4)	
Nationality		
Nepalese	68.3 (6.0)	0.001*
Indian	65.1 (5.4)	
Sri Lankan	66.5 (4.8)	
Other	68.1 (4.7)	
Fathers' Profession		
Medical	66.4 (5.6)	0.196
Non-medical	67.4 (5.6)	
Mothers' Profession		
Medical	67.5 (6.3)	0.833
Non-medical	67.0 (6.0)	
House wife	67.3 (5.3)	

[Table/Fig-4]: Mean attitude scores according to demographic characteristics of respondents.
*ANOVA test showed that there was a significant difference among subgroups (p<0.05) so Post-hoc Tukey's HSD test was performed and the mean score of Nepalese respondents' was significantly (p=0.001) higher compared to Indian respondents.

Characters	Mean (SD) Maximum score 200	p-value
Semester of study		
Second	140.1 (10.6)	0.006
Fourth	143.6 (10.7)	
Gender		
Female	141.7 (10.6)	0.981
Male	141.7 (11.1)	
Age (in years)		
18	138.3 (10.5)	0.567
19	141.3 (10.3)	
20	141.6 (11.0)	
21	143.1 (11.1)	
22	142.0 (11.0)	
23	146.7 (8.5)	
Nationality		
Nepalese	143.7 (11.2)	<0.001*
Indian	137.1 (11.0)	
Sri Lankan	141.1 (8.4)	
Other	144.8 (9.0)	
Fathers' Profession		
Medical	140.4 (11.0)	0.260
Non-medical	142.1 (10.6)	
Mothers' Profession		
Medical	141.5 (10.9)	0.826
Non-medical	141.2 (11.5)	
House wife	142.1 (10.3)	

[Table/Fig-5] Mean total scores according to demographic characteristics of respondents.
*ANOVA test showed that the scores were significantly different among subgroups (p<0.05) so Post-hoc Tukey's HSD test was performed and the mean score of Nepalese respondents' was significantly (p<0.001) higher compared to Indians and the score of respondents from other countries was significantly (p=0.017) higher compared to Indians.

Characters	Frequency (%) No	Frequency (%) Yes	Chi-square	p-value
Semester of study				
Second	30 (20.7)	115 (79.3)	1.364	0.243
Fourth	20 (15.3)	111 (84.7)		
Gender				
Female	24 (15.2)	134 (84.8)	2.133	0.144
Male	26 (22.0)	92 (78.0)		
Age (in years)				
18	3 (14.3)	18 (85.7)	4.793	0.309
19	10 (15.6)	54 (84.4)		
20	22 (22.9)	74 (77.1)		
21	11 (21.6)	40 (78.4)		
≥22	4 (9.1)	40 (90.9)		
Nationality				
Nepalese	35 (26.3)	98 (73.7)	14.001	0.003
Indian	10 (15.9)	53 (84.1)		
Sri Lankan	3 (5.2)	55 (94.8)		
Other	2 (9.1)	20 (90.9)		
Fathers' Profession				
Medical	8 (11.1)	64 (88.9)	3.509	0.173
Non-medical	42 (20.7)	161 (79.3)		
Mothers' Profession				
Medical	3 (7.1)	39 (92.9)	4.727	0.094
Non-medical	17 (17.7)	79 (82.3)		
House wife	30 (21.9)	107 (78.1)		

[Table/Fig-6]: Prevalence of self-medication among different subgroups of respondents.

than the score of Indian respondents i.e. 137.1 (11.0). Similarly, the mean total score of fourth semester students were significantly higher compared to second semester students. However, there was no significant difference in the total score according to respondents' gender, age, and the profession of their parents.

Two hundred and twenty six (81.9%) of 276 respondents mentioned that they had self-medicated during the one year period preceding the study and 149 respondents (54%) shared that previous experience with the medicine was one of the information sources for self-medication. Similarly, 92 (33.3%), 56 (20.3%), 51 (18.5 %) and 30 (10.9%) respondents shared that communication with their parents, their textbooks, Medical Shop (Pharmacy) and others (including internet), respectively, were used as information sources for self-medication. As the respondent could choose multiple answers in response to this question, the total per cent was more than 100.

Comparison of the reported prevalence of self-medication during the preceding year showed there was no statistically significant difference among respondents by semester of study, gender, age, and profession of the parents. However, there was a significant difference among respondents of different nationalities. The use of self-medication was more common among Sri Lankan respondents compared to Nepalese respondents [Table/Fig-6]. Painkiller (73.2%), antipyretics (68.8%), and antimicrobials (56.2%) were most commonly used medicine for self-medication [Table/Fig-7].

Certain free text comments by respondents about self-medication are mentioned below. Some of the comments were:

- Self-medication should only be done in emergency or for minor/common health problems.
- Self-medication is not good/safe.
- People self-medicate to avoid unnecessary diagnostic tests and save time waiting for doctors in modern hospitals.
- Pharmacy should not dispense medicine without prescriptions at least for the antibiotics and medicines that cause addiction abuse and severe side effects.

Frequency	Pain killers N(%)	Skin ointments N (%)	Anti-pyretic N (%)	Anti-allergic N (%)	Anti-microbials N (%)
Once a week	16 (5.8)	20 (7.2)	4 (1.4)	9 (3.3)	3 (1.1)
Every 2-3 week	34 (12.3)	19 (6.9)	10 (3.6)	21 (7.6)	10 (3.6)
Every 2-3 months	62 (22.5)	38 (13.8)	74 (26.8)	41 (14.9)	51 (18.5)
More than 5 times per year	80 (29.0)	53 (19.2)	93 (33.7)	65 (23.6)	84 (30.4)
Nearly all the times	10 (3.6)	19 (6.9)	9 (3.3)	15 (5.4)	7 (2.5)
No response	74 (26.8)	127 (46.0)	86 (31.2)	125 (45.3)	121 (43.8)

[Table/Fig-7]: Practice of self-medication (Frequency of use of selected medicines used for common health problems).

- OTC drugs could be used for self-medication but not antibiotics.
- Growing use of antibiotics for self-medication should be controlled because it leads to resistance.
- Self-medication is practically unavoidable.
- I would not suggest self-medication to my patients. But for me I self-medicate because with the help of the internet and text book I can diagnose my disease easily.
- Self-medication is a double edge sword. If used wisely it can be beneficial but haphazard use can lead to severe life threatening sequel.
- Self-medication is not good in developing and under developed countries because most of the people are illiterate which may lead to severe complications.
- To avoid the embarrassing moments e.g. take off clothes, questions by physician, I self medicate.
- Pharmacy dispensing medicine without prescription should be penalized.
- Self-medication is economically viable and reduces doctors' workload. People should be taught about hazards of self-medication.

The factors promoting self-medication, as shared by the respondents, are as follows:

- Lack of knowledge and education promotes self-medication.
- Doctor parents influence for self-medication to their child.
- If both the parents are doctors, we have easy access to sample medicines so we self-medicate more.
- Lack of health care professionals in developing countries also drives people for self-medication.
- Frequent exposure to the same medicine also promotes self-medication.
- Increased health care cost and increased availability and use of internet have increased self-medication.
- Previous experience with medicine, left over medicine of previous prescription and inconvenience to visit the doctor promote self-medication.
- Influence of self-medicating peer group.

DISCUSSION

The students' overall knowledge and attitude about self-medication in the present study was encouraging. The scores were significantly higher among fourth semester students compared to those in the second semester. Mean knowledge score and total score about self-medication was significantly lower among Indian students compared to students from Nepal and other countries. The mean attitude score for Indian students was lower than Nepalese students.

The overall prevalence of self-medication in our study (81.9%) was comparable to the prevalence (82.3%) reported among medical students (including interns) in Ahmedabad, India [13] and in Serbia (79.9%) [15] and greater than the incidence (55.2%) reported from Egypt [9].

Unlike, the findings from Serbia where prevalence of self-medication was dependent on age and gender [15], in our study the prevalence did not significantly differ according to semester of study, gender, and age. The respondents through their free text comments, shared that if their parent/s is/are medical doctor/s then their accessibility to medicines increases so the chance of self-medication increases. In the present study, the proportion of respondents, whose parent/s is/are medical doctor, practicing self-medication was higher compared to respondents whose parent/s was/were nonmedical personnel. However, the difference was not significant. A higher proportion of Sri Lankan students and students from other countries were practicing self-medication compared to students from Nepal or India. Students from Sri Lanka, Maldives and other countries express difficulty in communicating with people in Pokhara (mainly due to language problems), which may be one of the reasons for higher incidence of self-medication. Almost 50% of students from Maldives had worked as Clinical Assistant before joining the MBBS program at MCOMS which might have also encouraged self-medication (Out of 22 respondents from other countries, 21 were Maldivian and 1 was American). As shared in the free comments by the respondents, the peer pressure of the self-medicating students might have some influence. Further and in-depth study is required.

Studies have reported that the practice of self-medication increases as student progress through medical school [13,16-18]. Banerjee et al., reported significant difference ($p<0.001$) in proportion of students practicing self-medication 41.67% (first year) Vs 79.31% (Final year) [16]. Similarly, the proportions were 89.4% (first year) vs 94.1% (final year) ($p= 0.038$) in the study conducted in Slovenia [17] and 52.6% (2 year) vs 73.3% (4 year) ($p= 0.02$) in study conducted in Bahrain [18]. In this study the self-medication prevalence among fourth semester students was higher compared to the second semester but the difference was not significant. The finding is in congruence with the study done in Nagpur, India where prevalence of self-medication in first year and third year students were 78.0% and 74.7%, respectively and the difference was not significant [12]. Even though, in present study, the knowledge and attitude of self-medication was higher among fourth semester respondents compared to second semester, the prevalence of self-medication was not significantly different.

Lukovic et al., reported that female respondents self-medicate more than males ($p<0.001$). In our study, proportion of self-medicating female respondents were more compared to male respondents but the difference was not significant [15]. Similar to our study, the study from India also reported no significant association of self-medication with gender [13].

Almost three quarter (73.2%) of the respondents had used painkillers to self-medicate; similarly antipyretics (68.8%), antimicrobials (56.2%) and anti-allergics (54.7%) were commonly used in the study. In another study conducted in Nepal the percentage of respondents using analgesic, antipyretics, antibiotics and anti-allergies for self-medication was 75.8%, 46.8%, 40.3% and 35.5%, respectively [10]. Similarly, in the study conducted among medical students in Bahrain the proportions were analgesic (81.3%), antipyretics (43%), antibiotics (6%) and anti-allergies (13%) [19]. Various other studies

have also reported analgesics and anti-pyretics to be the most common medicine used for self-medication [7,13,15].

Antibiotics use for self-medication was 41% in Egypt, 38.9% in Serbia, 31.09% in West Bengal, India, 34% in South India and up to 34.8% in Nagpur, India [7,9,14-16]. In our study, more than half (56.2%) of the respondents reported using antimicrobials. This higher proportion of use of antimicrobials may be of great concern because over use and irrational use of antimicrobials may lead to resistance. Some respondents, through their free text comments, shared their apprehensions regarding use of antimicrobials for self-medication or availability of antimicrobials without a prescription. Few of them suggested for enforcement of strict regulations and severe penalties for defaulters. This shows that the respondents were aware of the problem uncontrolled and irrational use of antimicrobials in the region. Availability of antibiotics without prescription was also reported in a previous study conducted in Pokhara [6].

In a previous study conducted in Nepal among medical and paramedical students, 60.3% of respondents used pharmacist as a source of information which is higher than that reported in our study (18.5%) [10]. In our study, 20.3% of respondents reported to use text book as a source of information for self-medication which is less compared to other studies e.g. 46% [10], 39% [7] and 44.5% [12]. Mehta et al., reported that 34.7% used the same medicine which had been previously prescribed to them when they experienced similar symptoms [10] but in our study 54% of respondents shared that previous experience with the medicine was one of the reasons to self-medicate.

LIMITATIONS AND STRENGTH OF THE STUDY

As the questionnaire was self-administered and information about self-medication in the preceding one year was collected, there could be recall bias. Although the respondents were requested to complete the questionnaire independently, discussion between the respondents could not be entirely ruled out. The strength of the study was the high response rate and good sample size.

CONCLUSION

The study shows high prevalence of self-medication among basic science medical students of the institution. The students' knowledge and attitude about self-medication is encouraging. High prevalence of self-medication with antibiotics is of concern. Further studies to investigate in detail the cause of high self-medication could be planned. There is a need of a module to educate and aware the students about advantages of responsible self-medication and drawbacks of self-medication. A similar can be carried out among students during the clinical years of study. Similar type of study on self-medication in various other medical colleges in Nepal may provide a clearer picture of self-medication among medical students of Nepal.

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