Original Article

Perception and Practices of Self-Medication among University Students in Lahore, Pakistan

Tooba Ali[1*], Muhammad Yaqoob[1], Sajid Hameed[1], Ghofran Aziz[2], Anam Naseer[1] and Safina Tariq[1]

[1]Department of Public Health, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan
[2]Department of Surgery, Hameed Latif Hospital, Lahore, Pakistan

ARTICLE INFO

ABSTRACT

According to World Health Organization, self-medication is defined as the "use of over-the-counter medication to treat self-diagnosed symptoms or disorders or for the continuous and re-use of prescribed medications for recurrent diseases." **Objective:** To compare the perception and practice of self-medication among medical and non-medical students at the University of Lahore, Pakistan. **Methods:** It is a comparative cross-sectional study with non-probability convenient sampling technique. Five hundred and eighty four students participated in this survey. The data were collected through questionnaire. **Results:** 98.6% of the students were self-medicating; 50.1% were medical and 49.9% were non-medical students. The frequency of medical students knowing more about the medicines they consumed needed a prescription, and self-medication is not safe to treat the illness is higher than in non-medical students. Personal knowledge was the main source and time saving was the main cause of self-medication. The frequency of medical students reading the leaflet is higher in medical than in non-medical students. The frequency of painkillers is higher in non-medical students compared to medical students. The most frequent indications for self-remedy in both groups were headache, fever, cough & common cold. **Conclusions:** The frequency of self-medication was high among the students of the University of Lahore. The population may be educated against the harmful effects of self-medication and authorities should monitor pharmacies that are part of the self-medication process.

INTRODUCTION

World Health Organization defines self-medication as the "use of over-the-counter medication (OTC) to treat self-diagnosed symptoms or disorders or for the continuous and re-use of prescribed medications for recurrent diseases"[1] It normally comprises over-the-counter drugs but also involves prescription-only medicines [2] Self-remedy without a valid reason wastes medical resources and promotes pathogenic susceptibility, polypharmacy, and drug-adverse responses that result in hospitalizations [3]. It includes circumstances in which people, household members, or communities use medications to treat medical ailments without prescription or diagnosis from a qualified healthcare professional [4]. Consumers' choices for self-remedy may be influenced by the severity of the illness, the kind of medicines, the patient's socio-economic situation, and cultural considerations [5, 6]. Numerous studies demonstrate the widespread use of self-remedy in advanced countries like Australia, Italy, and Spain, middle-income nations like Brazil and China, as well as low-income countries like Mongolia, Nepal, Ethiopia, Kenya, Pakistan, and Zimbabwe [7]. All over the globe, the practice of self-medication is very common; up to 68% in Europe and even much higher in the growing countries with percentages going as high as 92% among the teenagers of Kuwait [8]. In Jordan, self-medication was widely used (42.5%) [9]. In Nigeria, self-medication is used by more

212

employees directly involved in healthcare services (90.9%) than in non-healthcare services (62.9%) [10]. Our neighboring countries have quoted prevalence of self-medication as 60% in India [11], and 78% in Nepal [12]. Few studies concerning self-medication conducted in Pakistan show a prevalence of 68.8% [13]. The estimated level of self-remedy with antibiotics was 31.0% in Lithuania [14]. In a London study, analgesics used were reported to be 34.8% by females and 21.4% by males [15]. It is shown that in South Asian nations including India, Nepal, Bangladesh, and Pakistan, 50% of antibiotic purchase is made through over-the-counter drug sales, which is a significant factor in promoting self-remedy in those countries and it is also reported that more than 80% of all antibiotics purchased in underdeveloped countries are without a doctor's prescription [16]. In Pakistan, the majority of prescription-only medicines are available over the counter without a prescription [17]. However; there is a large variation among the different population groups with varying levels of socioeconomic status and education. The present survey aimed to compare the perception and practices of self-medication among healthcare and non-healthcare students at the University of Lahore, Pakistan.

METHODS

This is a comparative cross-sectional survey-based study conducted over nine months, from March to December 2022, at the University of Lahore, Pakistan. A non-probability convenient sampling technique was adopted. Healthcare students (MBBS) and Non-healthcare students (Engineering) of both genders were included in the study. However, sick students taking medication advised by a doctor were excluded from the survey. Ethical approval of the study was taken from the Ethical Committee of the University of Lahore (No. ERC/99/22/02, dated 17-02-2022). The data were collected through a self-administrated questionnaire [3, 8, 18]. The survey questionnaire reliability was checked by conducting a pilot study and calculating the Cronbach's alpha coefficient value as 0.474 [19]. Each participant was approached by the principal investigator (PI) for an interview after verbal written consent. Data from the completed forms were entered and statistical package for social sciences (SPSS) version 20.0 was used for data analysis. Both descriptive and inferential statistics were used for data analysis. The comparison between healthcare and non-healthcare students was completed in the analysis by applying the student's t-test for quantitative data and the Chi-square test for qualitative data as appropriate. p-value ≤ 0.05 was considered as the significant effect.

RESULTS

Five hundred and eighty-four students participated in this survey. They were uniformly split up into two groups; 292 students in group A (healthcare students) and 292 students in group B (non-healthcare students). 98.6% of the respondents were self-medicating; 50.1% were from healthcare and 49.9% were from the non-healthcare group. The basic demographic information of healthcare and non-healthcare students is shown in Table 1. In both groups, the number of students in the 17-22 years old category was significantly more as compared to the students of 23-28 years of age (p-value=0.001). The frequency of female students was substantially higher in contrast to male students in the healthcare group (p-value=0.000).

Table 1: Showing the distribution of different factors related to self-medication between medical and non-medical students. (N=584)

Variables	Category	Medical	Non-Medical	Total	Chi-square value	p-value
Age	17-22	202 (69.0%)	237 (81.2%)	439 (75.2%)	11.239	0.001
	23-28	90 (30.8%)	55 (18.8%)	145 (24.8%)		
Total		292 (100.0%)	292 (100.0%)	584 (100%)		
Gender	Male	116 (39.7%)	251 (86.0%)	367 (62.8%)	133.646	0.000
	Female	176 (60.3%)	41 (14.0)	217 (37.2%)		
Total		292 (100.0%)	292 (100.0%)	584 (100%)		
Distance from the hospital	<1 km	84 (28.8%)	63 (21.6%)	147 (25.2%)	5.405	0.067
	1-5 km	142 (48.6%)	144 (49.3%)	286 (49.0%)		
	>5 km	66 (22.6%)	85 (29.1%)	151 (25.9%)		
Total		292 (100.0%)	292 (100.0%)	584 (100%)		
Self-medication in last six months	Never	3 (1.0%)	5 (1.7%)	8 (1.4%)	49.660	0.000
	Once	109 (37.3%)	192 (65.8%)	301 (51.5%)		
	> once	180 (61.6%)	95 (32.5%)	275 (47.1%)		
Total		292 (100.0%)	292 (100.0%)	584 (00%)		

The reverse was seen in non-healthcare participants. A significantly higher number of students in the healthcare group in contrast to the non-healthcare group acknowledged the importance of having a prescription before visiting the pharmacy (p-value=0.000). Knowledge of reading drug leaflets before drug use was observed more among healthcare students (p-value=0.000) Table 2.

Table 2: Analysis of the perception of self-medication in medical and non-medical students (n=594)

Variables	Response	Medical	Non-Medical	Total	Chi-square value	p-value
Need of prescription prior to self-medication	Yes	244 (83.6)	195 (66.8)	439 (75.2)	22.028	0.000
	No	48 (16.4)	97 (33.2)	145 (24.8)		
Total		292 (100)	29 (100.0)	584 (100)		
Knowledge of drug safety	Yes	248 (84.9)	212 (72.6)	460 (78.8)	13.269	0.000
	No	44 (15.1)	80 (27.4)	124 (21.2)		
Total		292 (100)	29 (100)	584 (100)		
Reading leaflet	Yes	187 (64.0)	143 (49.0)	330 (56.5)	13.489	0.000
	No	105 (36.0)	149 (51.0)	254 (43.5)		
Total		292 (100)	292 (100)	58400)		

It was also found that the difference in personal knowledge was significantly higher in healthcare pupils as compared to non-healthcare pupils (p-value=0.000). However, friends

as a source of self-remedy were more with non-healthcare students as compared to healthcare counterparts (p-value=0001) Table 3.

Table 3: Analysis of sources of information about self-medication by the participants (n=594)

Sources	Medical	Non-Medical	Total	Chi-square value	p-value
Relatives	31 (10.6)	40 (13.7)	71 (12.2)	2.266	0.322
Friends	34 (11.6)	67 (22.9)	101 (17.3)	14.181	0.001
Personal knowledge	134 (45.9)	88 (30.1)	222 (38.0)	14.690	0.000
Mass media	14 (4.8)	25 (8.6)	39 (6.7)	3.325	0.068
Advised by doctors but without prescription	62 (21.2)	51 (17.5)	113 (19.3)	1.328	0.249
Pharmacists or those working in the pharmacy	17 (5.8)	21 (7.2)	38 (6.5)	0.450	0.502
Total	292 (100)	292 (100)	584 (100)		

Several reasons for self-medication were narrated by the participants. But in non-healthcare students, time-saving and privacy, as well as economic reasoning, were important driving factors for self-remedy as compared to healthcare students (p<0.05). Table 4.

Table 4: Distribution and comparison of reasons for self-medication by the medical and non-medical students. (N=584)

Sources	Medical	Non-Medical	Total	Chi-square value	p-value
Economical	23 (7.9)	33 (11.3)	56 (9.6)	1.975	0.160
Time-saving	66 (22.6)	85 (29.1)	151 (25.9)	3.224	0.073
Privacy	7 (2.4)	19 (6.5)	26 (4.5)	5.797	0.016
Quick relief	61 (20.9)	55 (18.8)	116 (19.9)	0.387	0.534
No hospital nearby	10 (3.4)	15 (5.1)	25 (4.3)	1.045	0.307
Conditions not worth seeing doctor	48 (16.4)	25 (8.6)	73 (12.05)	8.282	0.004
Previous experience	27 (9.2)	27 (9.2)	54 (9.2)	0.000	1.000
Health problem is not serious	42 (14.4)	30 (10.3)	72 (12.3)	2.281	0.131
Embarrassed of discussing own symptoms	8 (2.7)	3 (1.0)	11 (1.9)	2.316	0.218
Total	292 (100.0)	292 (100)	584 (100)		

The most commonly used drugs for self-medication were painkillers and antibiotics by both healthcare and non-healthcare students. The proportions of different types of self-remedies were significantly more common in non-medical students as compared to the medical students except for drugs used for cold and flu Figure 1.
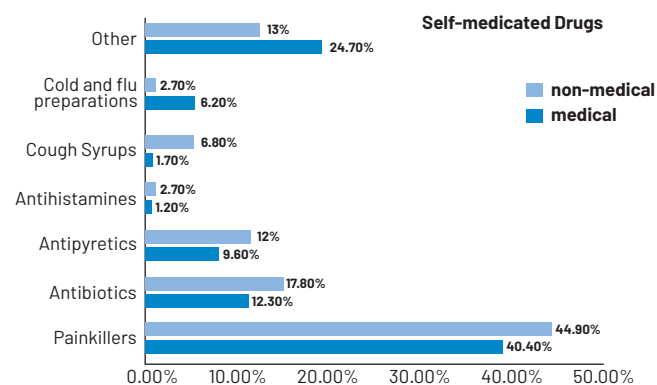

Figure 1: Bar graph showing self-medication drugs taken by the

medical and non-medical students in the last 6 months. Headache was the most frequently encountered symptom (33.7%) in the study groups. Antipyretics were taken more frequently by the non-healthcare students as compared to healthcare students but the reverse was observed in cases of heartburns/ulcers and other drugs like disorders of digestive systems, toothache, menstruation problems, contraception, insomnia, and hemorrhoids (p-value<0.05). Figure 2.
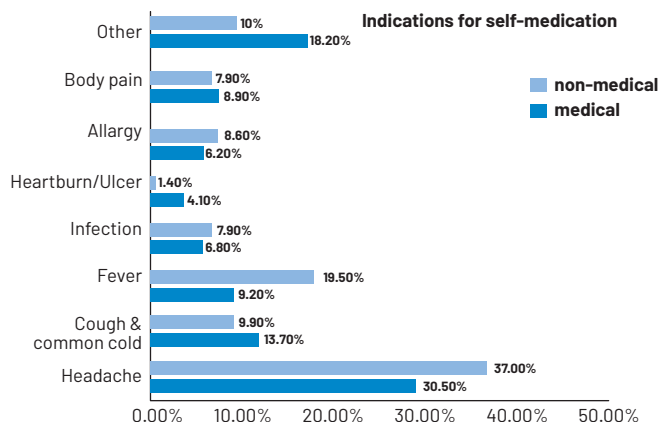

Figure 2: Bar graph regarding indications for self-medication in last 6 months by the participants

DISCUSSION

The prevalence of self-medication as found in this study is 98.6%. This result is consistent with some other studies conducted in Pakistan and abroad [20, 21]. But lower prevalence is shown in other surveys conducted in various underdeveloped countries such as 68.1% in Ethiopia, 78.6% in India, 67.7% in Saudi Arabia, and 62.9% in Egypt [22, 23] This difference in the prevalence of self-remedy could be due to many factors like the design of the study, the age group of the participants, sex, cultural practices, and legal implications. People in Pakistan can buy over-the-counter medications without any restriction as drug stores do not follow the pharmacy laws in Pakistan [24]. Such practice is also common in many other developing countries [25]. The findings of the present study show that medical students practiced self-medication more than non-medical students most probably due to medical knowledge and exposure of the medical students. The current study also shows that the practice of self-remedy is decreasing with increasing age for both medical and non-medical students and this finding is matching with the finding of another study conducted by Kassa *et al.*, in selected hospitals in Addis Ababa, Ethiopia in 2017 [26]. In the present study, nearly 16% of healthcare students and 33% of non-healthcare students were unaware that the prescription requirement applied to the medications they self-prescribed. A study conducted in 2019 by Alshahrani *et al.*, revealed a high proportion of medical students (60.6%) not

Ali T *et al.,*

knowing the need for a physician's prescription for medication[1]. The current study demonstrates that 84.9% of healthcare pupils and 72.6% of non-healthcare pupils expressed that self-medication is safe to treat the illness. However, a low level of drug safety knowledge was reported by Alshahrani and associates, i.e. 24.8% of healthcare pupils and 36.2% of non-healthcare pupils [1]. In the present study, 64.0% of healthcare pupils and 49.0% of non-healthcare pupils read the leaflet before using medicines. A higher proportion of both healthcare pupils and non-healthcare pupils were reading the leaflets in another study [27]. Personal knowledge came out to be a strong driving force for self-remedy in both healthcare and non-healthcare students. However, this factor was significantly more frequent in healthcare students as compared to non-healthcare counterparts (p<0.05). Because of the easy availability of physicians' advice, medical students were seen as more prone to indulge in self-medication without a prescription. Similar results have been shown in another study from Karachi [28]. Time savings is the most frequently cited justification for self-remedy among the study groups. Table 4. This result is consistent with earlier research from Madinah, Saudi Arabia [29]. Another study conducted in Saudi Arabia by Alshahrani and co-workers in the year 2019 also found the most frequent reason for self-remedy was a time-saving factor for both healthcare and non-healthcare students. We also found that the perception of medical students of not visiting the doctor and considering the ailment as milder was significantly more as compared to non-medical university fellows (p<0.05), an observation found in other studies also [1]. The subjects of the current study commonly used a variety of drug classes to treat various illnesses. (Figure 1). However, the selection of drugs is influenced by the study discipline. Pain killers, antipyretics and antibiotics were more frequently used by the non-healthcare students as compared to the healthcare counterparts. Based upon a cross-sectional study in Karachi, Khan *et al.,* have reported an opposite trend. Antipyretic, analgesic and antibiotics were the most frequently used drugs used by the undergraduate medical students [29]. The emergence of antimicrobial medication resistance is a serious issue. 15% of the respondents in this research use antibiotics without a doctor's advice, despite the Ministry of Health's numerous efforts to educate people on the topic. This issue has been addressed by other researchers also [30]. In both groups of students, the leading indications for self-remedy were headache. Cough & common cold and fever, but the proportions of these ailments were slightly higher among medical as compared to non-medical students (Figure 2). A study conducted by Musa *et al.,* in a private Medical College in Peshawar has also

revealed that fever, headache, and sore throat were the most common motives for self-medication among students [31]. Khan *et al.,* from Karachi have reported that easy availability and minor ailments were two major reasons for self-remedy among medical students [29]. The most common neurological complaint in the present study is headache (33.7%). A systematic review of three Arab countries, Saudi Arabia, Qatar, and Oman have reported that the prevalence of headache in the public sector varied from 8 to 83.6%. The second most frequent indication for self-medicating was cough and cold/flu. Most people in our population are familiar with these symptoms and perceive that colds usually present with mild symptoms. They often tend to self-medicate rather than make the effort to book an appointment for a medical consultation. Or they visit the nearby pharmacy to purchase a few tablets of Rigix and Paracetamol. Similar findings have been found in another study[32].

CONCLUSIONS

The present study suspected a high prevalence of self-remedy practice among university students at the University of Lahore. The frequency of medical students knowing medicines they consume need a prescription, potential adverse drug reactions and self-medication is not safe to treat the illness is significantly higher than non-medical students. Personal knowledge was the main source of self-medication in both groups but notably more in medical than non-medical students. The frequency of medical students reading the leaflet before taking medicines is higher than non-medical students. Time-saving was the main cause of self-medication in both medical and non-medical students.

Authors Contribution

Conceptualization: TA
Methodology: MY, ST
Formal analysis: ST
Writing-review and editing: SH, GA, AN

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

REFERENCES

[1]   Alshahrani SM, Alavudeen SS, Alakhali KM, Al-Worafi YM, Bahamdan AK, Vigneshwaran E. Self-medication among king khalid university students, Saudi Arabia. Risk Management and Healthcare Policy. 2019 Nov: 243-9. doi: 10.2147/RMHP.S230257.

[2]   Helal RM and Abou-ElWafa HS. Self-medication in university students from the city of Mansoura, Egypt. Journal of Environmental and Public Health. 2017 Apr; 2017: 1–7. doi: 10.1155/2017/9145193.

[3]   Garofalo L, Di Giuseppe G, Angelillo IF. Self-Medication Practices among Parents in Italy. BioMed Research International. 2015 Oct; 2015: 1–8. doi: 10.1155/2015/580650.

[4]   Onchonga D, Omwoyo J, Nyamamba D. Assessing the prevalence of self-medication among healthcare workers before and during the 2019 SARS-CoV-2 (COVID-19) pandemic in Kenya. Saudi Pharmaceutical Journal. 2020 Oct; 28(10): 1149–54. doi: 10.1016/j.jsps. 2020.08.003.

[5]   Shrivastava B, Bajracharya O, Shakya R. Prioritizing intervention measures to prevent inappropriate self-medication practices using the Analytical Hierarchy Process. Exploratory Research in Clinical and Social Pharmacy. 2022 Mar; 5: 100117. doi: 10.1016/j.rcsop. 2022.100117.

[6]   Al Shawi A. Self-medication among medical students in Anbar and Fallujah Universities – Iraq. Journal of the Faculty of Medicine Baghdad. 2019 Mar; 60(3). doi: 10.32007/jfacmedbagdad.603178

[7]   Akhtar SS, Heydon S, Norris P. Bringing medicine from Pakistan and self-medication among Pakistani mothers in New Zealand. Journal of Immigrant and Minority Health. 2022 Jun; 24(3): 682–8. doi: 10.1007/s10903-021-01228-1.

[8]   Zafar SN, Syed R, Waqar S, Zubairi AJ, Vaqar T, Shaikh M, *et al*. Self-medication amongst university students of Karachi: prevalence, knowledge and attitudes. Journal of the Pakistan Medical Association. 2008; 58(4): 214–7.

[9]   Yousef AM, Al-Bakri AG, Bustanji Y, Wazaify M. Self-medication patterns in Asmman, Jordan. Pharmacy World & Science. 2008 Jan; 30(1): 24–30. doi: 10.1007/s11096-007-9135-x.

[10]   Bamgboye EA, Amoran OE, Yusuf OB. Self medication practices among workers in a tertiary hospital in Nigeria. African Journal of Medicine and Medical Sciences. 2006 Dec; 35(4): 411–5.

[11]   Rathod P, Sharma S, Ukey U, Sonpimpale B, Ughade S, Narlawar U, *et al*. Prevalence, Pattern, and Reasons for Self-Medication: A Community-Based Cross-Sectional Study from Central India. Cureus. 2023 Jan; 15(1): 1–7. doi: 10.7759/cureus.33917.

[12]   Ghimire P, Pant P, Khatiwada S, Ranjit S, Malla S, Pandey S. Self-medication practice in Kathmandu Metropolitan City: A cross-sectional study. SAGE Open Medicine. 2023 Mar; 11: 1–8. doi: 10.1177/2050312 1231158966.

[13]   Farooqi UG, Khan FA, Iqbal J, Khalid AY, Saleem MA, Mustafa G. A Cross-Sectional Survey to Evaluate Self-Medication Among Medical Students in Karachi, Pakistan. Journal of Positive School Psychology. 2023 Mar; 2: 1178–82.

[14]   Pavydė E, Veikutis V, Mačiulienė A, Mačiulis V, Petrikonis K, Stankevičius E. Public knowledge, beliefs and behavior on antibiotic use and self-medication in Lithuania. International Journal of Environmental Research and Public Health. 2015 Jun; 12(6): 7002–16. doi: 10.3390/ijerph120607002.

[15]   Isacson D and Bingefors K. Epidemiology of analgesic use: a gender perspective. In European Journal of Anaesthesiology. EJA 2002 Jan; 1(19): 5–15. doi: 10.1097/00003643-200219261-00003.

[16]   Jamhour A, El-Kheir A, Salameh P, Abi Hanna P, Mansour H. Antibiotic knowledge and self-medication practices in a developing country: A cross-sectional study. American Journal of Infection Control. 2017 Apr; 45(4): 384–8. doi: 10.1016/j.ajic. 2016.11.026.

[17]   Mumtaz Y, Jahangeer SA, Mujtaba T, Zafar S, Adnan S. Self medication among university students of Karachi. Jlumhs. 2011 Sep; 10(03): 102–5.

[18]   Alshogran OY, Alzoubi KH, Khabour OF, Farah S. Patterns of self-medication among medical and nonmedical University students in Jordan. Risk Management and Healthcare Policy. 2018 Sep; 11: 169–76. doi: 10.2147/RMHP.S170181.

[19]   Leontitsis A and Pagge J. A simulation approach on Cronbach's alpha statistical significance. Mathematics and Computers in Simulation. 2007 Jan; 73(5): 336–40. doi: 10.1016/j.matcom.2006.08. 001.

[20]   Akram A, Maqsood U, Latif MZ, Arshad HS, Riaz H, Qureshi MA. Self-medication phenomenon; a population based study from Lahore. Cough. 2019 Apr; 402(53.9): 523–6.
21.Alshammari F, Alobaida A, Alshammari A, Alharbi A, Alrashidi A, Almansour A, *et al*. University Students'

[21]   Self-Medication Practices and Pharmacists' Role: A Cross-Sectional Survey in Hail, Saudi Arabia. Frontiers in Public Health. 2021 Dec; 17(9): 2083. doi: 10.3389/fpubh.2021.779107.

[22]   Turner JP, Shakib S, Singhal N, Hogan-Doran J, Prowse R, Johns S, *et al*. Prevalence and factors associated with polypharmacy in older people with cancer. Supportive Care in Cancer. 2014 Jul; 22: 1727–34. doi: 10.1007/s00520-014-2171-x.

[23]   Khairy WA, Nasser HA, Sarhan MD, El Shamy AA, Galal YS. Prevalence and Predictors of Self-Medication with Antifungal Drugs and Herbal Products Among

University Students: A Cross-Sectional Study from Egypt. Risk Management and Healthcare Policy. 2021 May 27: 2191-200. doi: 10.2147/RMHP.S308400.

[24] Gillani AH, Ji W, Hussain W, Imran A, Chang J, Yang C, *et al.* Antibiotic self-medication among non-medical university students in Punjab, Pakistan: a cross-sectional survey. International Journal of Environmental Research and Public Health. 2017 Oct; 14(10): 1152. doi: 10.3390/ijerph14101152.

[25] Rehman M, Ahmed S, Ahmed U, Tamanna K, Sabir MS, Niaz Z. An overview of self-medication: A major cause of antibiotic resistance and a threat to global public health. JPMA The Journal of the Pakistan Medical Association. 2021 Mar; 71(3): 943-9.

[26] Kassa T, Gedif T, Andualem T, Aferu T. Antibiotics self-medication practices among health care professionals in selected public hospitals of Addis Ababa, Ethiopia. Heliyon. 2022 Jan; 8(1): e08825. doi: 10.1016/j.heliyon.2022.e08825.

[27] Ali H, Naureen ON, Ahmad A, Yasmeen S, Mehmood R, Arshad A. Assessment of self-medication among medical and non-medical students. Biomedica. 2015 Oct; 31(4): 311.

[28] Lakhani MJ, Hasan SMU, Tariq A, Iqbal M, Ghafoor HA, Khalid M, *et al.* Evaluation of the self-medication patterns among university students of Karachi. Pakistan Oral & Dental Journal. 2019 Apr; 39(2): 155-8.

[29] Khan H, Siddiqui A, Khan M, Jiskani A, Kumari D, Hayee A, *et al.* Self-Medication among Undergraduate Students. Journal of University Medical & Dental College. 2020 Aug; 10: 277-81. doi: 10.51985/JBUMD C2020039.

[30] Sunny TP, Jacob R, Krishnakumar K, Varghese S. Self-medication: Is a serious challenge to control antibiotic resistance?. National Journal of Physiology, Pharmacy and Pharmacology. 2019 Jun; 9(9): 821-7.

[31] Musa N, Amirzadah S, Mehmood Y, Ahad B, Salman S, Khan SZ. Self medication frequency and its contributing factors among medical students of private medical and dental college of peshawar. Journal of Khyber College of Dentistry. 2019 Mar: 345: 9294158.

[32] Benamer HT, Deleu D, Grosset D. Epidemiology of headache in Arab countries. The Journal of Headache and Pain. 2010 Feb; 11(1): 1–3. doi: 10.1007/s10194-009-0173-8.