Original Article

Self-medication Survey among Pharmacy Students in Iraq

Muhannad R. M. Salih, Arwa Y. Abd

Department of Pharmacy,
Al-Rasheed University
College, Baghdad, Iraq

ABSTRACT

Background: Self-medication (SM) is the self-administration of treatment without a medical prescription or consultation or guidance from a physician or a health-care provides. **Aim and Objectives:** This study aims at understanding the existing prevalence of self-medication (SM) and finding out underlying circumstances among pharmacy students of the two universities. **Materials and Methods:** A study was undertaken involving pharmacy students of two universities in Baghdad. The students' responses obtained from a self-administered questionnaire were analyzed to assess the prevalence and attitude of students toward SM. **Results:** The data obtained from a valid questionnaire form answered by 188 students revealed that 63.3% had indulged in SM, and 39.9% reported practicing on rare occasions. The majority (48.9%) relied on the information received from the pharmacist with 44.7% and 16% of them had used over-the-counter and prescription-only medicines, respectively. 54.8% of participants were against SM but reported that it could be used in rare situations. **Conclusions:** The prevalence of SM was high among study participants. Therefore, necessary steps are needed to create awareness about the irrational use of SM and prevent the sale of medicines without a prescription.

KEYWORDS: *Medicine, pharmacy students, prevalence, self-medication*

INTRODUCTION

Self-medication (SM) is the self-administration of treatment without a medical prescription or consultation or guidance from a physician or a health-care provider.[1,2] It largely includes the use of over-the-counter (OTC) medications; however, it may also involve prescription-only medicines (POM), which might have been generally procured by reutilizing/submitting a previous prescription or consuming leftover medicines already available at home.[3,4] Moreover, SM is not confined to drug intake but includes interventions aimed at changing lifestyle as well.[5]

The phenomenal increase in SM practices is because it is regarded as a better option for the costly and time-consuming clinical consultations.[6] It is common in countries with strict and defined regulations on the sale of medicines or in countries/regions where health-care facilities are not easily accessible.[7-10] Despite rules and regulations, many pharmacy outlets sell drugs and antibiotics without valid medical prescriptions. In most cases, SM leads to serious consequences such as drug resistance, an increased risk of misdiagnosis, adverse drug reactions (ADRs), delay in diagnosis of illness, development of comorbidities, and even death.[11,12] However, both in developing countries such as Iran, Sudan, Jordan, India, Pakistan, and Brazil as well as in developed countries such as Spain, Greece, Russia, USA, Italy, and Malta, it is emerging as a serious public health problem as highlighted by Sarahroodi *et al.*, 2010. The use of SM varies globally and also diseases-wise.[7] A study conducted in Catalonia, Spain, to analyze remedies used by the general population for the treatment of their pain, revealed that about 27% used SM.[13] A report among students in Egyptian University showed that 71.1% suffering from cold opted to SM, followed by headache (58.9%) and sore throat (38.85%).[14] A study in Arkansas, USA, aimed to evaluate pharmacist services to patients for self-care with OTC medications, showed that about 71% of men and 82% of women had self-medicated at least once in the past 6 months and had sought pharmacist services.[15] In the

Address for correspondence: Dr. Muhannad R. M. Salih,
Department of Pharmacy, Al-Rasheed University College,
Baghdad, Iraq.
E-mail: muhannad.salih@alrasheedcol.edu.iq

Access this article online

Quick Response Code:

Website: www.jpbsonline.org

DOI: 10.4103/jpbs.JPBS_806_20

United Kingdom and Northern Ireland, a study showed that 41.5% of participants had consumed medicines without a doctor's prescription.[16]

SM is relatively widely practiced among university students and has been attributed partly to the electronic media/internet, where pharmaceutical products are advertised with brief information about its usage.[4,16-19] Studies among university students from Ljubljana (Slovenia), Bahrain, and western Uttar Pradesh (India) have cited students' past experience, advice from parents/friends, medical emergency or urgency, convenience, time-saving, nonavailability of transport, and having adequate knowledge to treat the symptoms as the reasons for practicing SMs whereas studies from Palestinian and Islamabad, Pakistan reported lack of time and cost of consultation.[17,18,20-22] Nevertheless, SM may play a crucial role in reducing medical services' burden and may help prevent aggravation of a medical situation, if practiced appropriately.[1]

As stated above, university students are most vulnerable to SM because of their ability to find information about medications through the internet, especially pharmacy students, as their curriculum includes rational use of medicines and the consequences of irrational use. These future pharmacists may find themselves counseling patients on the safe use of medicines and play a significant role in patient care, especially regarding this practice later in their life. Hence, understanding the practice and self-beliefs related to SM in this population is of paramount importance. Moreover, precise estimates of SM frequency may also help policymakers in designing programs aimed at preventing abuse of SM. Thus, this study aims to understand the existing prevalence of SM and finds underlying circumstances among pharmacy students of the university.

MATERIALS AND METHODS

This cross-sectional survey was conducted among undergraduate students of Pharmacy Department/Al-Rasheed University College (private) and Pharmacy College/University of Baghdad (government), both located in the city of Baghdad. These two universities were selected due their proximity to the site of this research study. Second, the aim was to compare views about SM in students of government-aided university and a private university. The duration of data collection was 1 month in December 2018. It was duly approved by the ethical committee of the Al-Rasheed University College, Baghdad, Iraq (Approval no. 89).

Participants

Pharmacy undergraduate students were identified as the target population of the study. Students from the

4th and 5th year of the courses were approached in their free time (10 min) between their lectures break, and written consent was taken from all the students willing to participate in the study. The consenting students were provided with a questionnaire to answer. Students were allowed to take questionnaires to their homes if asked and return them to the investigator at their convenience.

In total, 270 students in their 4th and 5th years of studies from the two universities participated in the study. Among these, 165 students were from the Pharmacy Department/Al-Rasheed University College, and 105 were from the Pharmacy College/University of Baghdad (government).

Questionnaire

The research instrument (Questionnaire) was taken from a previously validated study.[23] It was minorly amended by a panel of experts, which included academicians, health practitioners, and pharmacists.

The questionnaire consists of three sections. Section 1 covered information related to sociodemographics that included age, gender, college affiliation, year of study, residence status, siblings, and past illness. Section 2 included questions concerning the prevalence of SM, practice, frequency of SM per month, source of information, type and nature of medicines used, and place of obtaining medications, as well as common symptoms experienced prompting SM. Section 3 had questions that investigated students' beliefs and attitudes toward SM. Together with the three Sections, there were a total of 17 questions to answer. The categories of variables identified were students' demographics.

RESULTS

Out of 270 survey forms distributed, 216 responses were received, giving an accumulative response rate of 80%. However, due to missing data, only 188 questionnaire forms were considered in this study, giving a useful rate of 69%. Table 1 shows the sociodemographic of responders. About 2/3rd of total responders (n = 112, 59.6%) were females. Further, 78.8% (n = 148) of the total were from Government College, and 21.3% (n = 40) were from a private college. A majority (n = 111, 59%) of the responders were in the fourth preparatory year, and rests (n = 77, 41%) were in the 5th preparatory year. The bulk of students (n = 154, 81.9%) lived were their families. About 50% (n = 92) of the total responders had 1–2 siblings, whereas 28.7% (n = 54) had 3–5 siblings. An overwhelming of the students (n = 155, 82.4%) felt that they were healthy and about 10% reported suffering from noncommunicable disorders such as diabetes mellitus, anemia, hypertension, thyroid disorders, and depression.

The majority of the responders (n = 119, 63.3%) had indulged in SM previous month, as shown in Table 2. Out

of 188 participants, 39.9% (*n* = 75) reported practicing SM on rare occasions (once a month), whereas almost equal number (*n* = 74, 39.4%) had not practiced SM last month. In the study, the majority (*n* = 91, 48.9%) relied on the information received from the pharmacist, whereas only 16.5% (*n* = 31) received it from their physician. Surprisingly, only 8.5% (*n* = 16) sought information from the internet. Almost half of the participants (*n* = 84, 44.7%) used OTC medications in their SM practices, whereas only 16% (*n* = 30) of them used POM.

The study results demonstrated that the majority of the respondents (*n* = 134, 71.3%) usually got their medicines from pharmacies, and 23.9% (*n* = 45) used leftover medicines available at home, indicating previous experience in treating illness. Headache, pain, dysmenorrhea, cold, and flu were the most common symptoms (60%) experienced. Almost 50% of the students claimed that analgesic, antibiotics, cold, and flu medications were the utmost regularly used items in their SM practice. Surprisingly, only 4.8% (*n* = 9) had taken multivitamins in their SM practices.

Around 51% of the participants highlighted that mild illness or previous experience as a reason in favor of SM [Table 3a]. In addition, 12.8% responded that self-knowledge is enough to self-medicate rationally, and 3.2% considered that it played an important role in managing their health, with 3.7% favored SM as it was time savings and avoided waiting in a queue at physicians' clinics. Despite being of students of the 4th and 5th preparatory year, 10.1% were not sure about their views concerning SMs.

This survey's outcome also showed that 17.6% approved that consultation with a physician is needed for the treatment of illness, with 8% agreeing that a patient cannot rationalize SM. Moreover, 24.5% were aware of the ADR associated with medications. Nearly one-third of the respondents were not sure about reasons against or in favor of SM practices. Nevertheless, more than half of the investigated participants (54.8%) were not in favor of SM, but at the same time, they reported that it could be used in rare situations.

A deeper analysis elucidated students living with either family (72.7%) or alone (78.3%) relied upon pharmacy to procure medicines. In contrast, there was no specific preference for those living with friends [Table 3b]. Only 28.6% of students were in favor of SM practices, whereas higher percentages (72.7%) of students living with friends were in favor of SM. The majority of those staying alone (73.9%), as well as students in the 4th year of academics (63.1%), responded that it could be used in rare situations. In contrast, their seniors (students in the 5th year of their academics) viewed differently with 36.4% in favor, 20.8% against SMs, and 42.9% said that

it could be used in rare situations. Again, students living with family (52.6%) said that pharmacists were their main source of information, whereas only twelve students of this group (7.8%) looked for the relevant information from the internet and 8.4% (*n* = 13) from their friends or relatives. Students living alone mostly relied largely upon either pharmacist (39.1%) or physicians (34.8%), with 3 students (*n* = 13) considered the internet as the source of information about medicines. The third category of students staying with their friends preferred either contacting a physician (36.4%) or their family/friends (27.3%). One in each of these categories of students responded that they choose pharmacists or the internet for the information.

DISCUSSION

The present study indicates that SM is widely practiced (119/188, 63.3%) by the pharmacy students of Al-Rasheed University College and the College of

Table 1: Sociodemographic of students participated (*n*=188)		
Item	**Number of students**	**Percentage**
Gender		
Male	76	40.4
Female	112	59.6
College		
Private	148	78.7
Government	40	21.3
Preparatory year		
Fourth	111	59
Fifth	77	41
Resident status		
Living with family	154	81.9
Living alone	11	5.9
Living with friends	23	12.2
Siblings		
No siblings	43	18.1
Between 1 and 2	92	48.9
Between 3 and 5	54	28.7
More than 6	8	4.3
Illness		
Healthy	155	82.4
Diabetes Miletus	6	3.2
Hypertension	2	1.1
Thyroid disorders	1	0.5
Anemia	6	3.2
Asthma	6	3.2
G6PD deficiency	2	1.1
Skin disease	5	2.7
Depression	5	2.7

Table 2: Information about practicing of self-medications

Question	n	Percentage
Did you practice self-medication this month?		
Yes	119	63.3
No	69	36.7
Frequency of practice		
No self-medication	74	39.4
Rarely (Once a month)	75	39.9
Frequently (Once every two week)	23	12.2
Very frequently (Once a week)	16	8.5
Source of Information		
Pharmacist	91	48.4
Physician	31	16.5
Family and Friends	18	9.6
Internet	16	8.5
More than one	32	17
Nature of the medication used		
Prescription only medicines	30	16
Non-prescription medication (OTC)	84	44.7
Both	74	39.4
Place of obtaining medications for self-medication		
Pharmacy	134	71.3
Friends	9	4.8
Available in house	45	23.9
Symptoms experienced		
Headache, fever and pain, dysmenorrhea	66	35.1
Cold and Flu Allergy	45	23.9
Gastric symptoms (Diarrhea/constipation/indigestion)	10	5.3
Throat, respiratory tract infection, and skin infection	10	5.3
Paleness	3	1.6
Wight loss	1	0.5
Depression	1	0.5
More than one	49	26.1
Non	3	1.6
Types of medications used for self-medication		
Analgesics/Antipyretics	55	29.3
Antibiotics	22	11.7
Cough and Flu	14	7.4
Anti-diarrheal/Laxatives	3	1.6
Anti-histamines	2	1.1
Multivitamins	9	4.8
Antihypertensive	2	1.1
Antiplatelet	1	0.5
I do not remember	6	3.2
More than one medication used	74	39.4

Pharmacy/Baghdad University, Iraq. Data from a recent study from Iraq among pharmacy students, although from the University of Baghdad and Al-Rafedain University College, also showed a higher percentage of (84.88%) pharmacy students practiced SMs.[24] Many studies have reported wide variations in practices of SMs within a country. In two separate studies conducted among students from two universities of Saudi Arabia reported different rates of SM practices. The prevalence of SM among Taibah University students, Madinah, Saudi Arabia was 64.8%, and there were significant differences with regards to students' faculty, study year, and family structure. The prevalence was higher among medical (66%), final years (75%), female (65.5%), and students living alone (77.8%).[25] On the other hand, it was overall only 26% in a study from Dammam, Saudi Arabia, where the prevalence rate varied widely between students from the pharmacy (19.61%) and

Table 3a: Attitude towards self-medications

Items	n	Percentage
Reasons in favor of self-medication practice		
Mild problems	76	40.4
Previous experience	22	11.7
I find SM practice as taking active role in managing my health	6	3.2
Waiting in queues and time issues	7	3.7
Lack of trust on prescribers	9	4.8
Self-knowledge is enough to self-medicate rationally	24	12.8
Informed by family members and friends	4	2.1
I am not sure	19	10.1
All of the above stated reasons.	21	11.2
Reasons against self-medication practice		
Consultation with physician is essential	33	17.6
Risk of adverse drug reactions (ADRs)	46	24.5
Practitioner can diagnose an illness	8	4.3
A patient cannot rationalize SM	15	8
Prescribing a medication is the job of a prescriber	14	7.4
I am not sure	54	28.7
All of the above stated reasons.	18	9.6
Advice to others regarding self-medication		
I am always in favor of SM practice	56	29.8
I am against SM but it can be used in rare situations	103	54.8
I am always against SM practice	29	15.4

Table 3b: Analysis of self-medications

	Source of medicines		
	Pharmacy	Friends	Available at home
Gender n (%)			
Male	63 (82.9)	4 (5.3)	9 (11.8)
Female	71 (63.4)	5 (4.5)	36 (32.1)
Residence status, n (%)			
With family	112 (72.7)	6 (3.9)	36 (23.4)
With friends	4 (36.4)	3 (27.3)	4 (36.4)
Alone	18 (78.3)	0 (0)	5 (21.7)

	Views about SM practice		
	In favor	Against, can be used in rare situations	Against
Residence status			
With family	44 (28.6)	84 (54.5)	26 (16.9)
With friends	8 (72.7)	2 (18.2)	1 (9.1)
Alone	4 (17.4)	17 (73.9)	2 (8.7)
Academic year			
Fourth year student	28 (25.2)	70 (63.1)	13 (11.7)
Fifth year student	28 (36.4)	33 (42.9)	16 (20.8)

	Source of information about medicines				
	Physician	Pharmacist	Family/Friends	Internet	More than one
Residence status					
With family	19 (12.3)	81 (52.6)	13 (8.4)	12 (7.8)	29 (18.8)
With friends	4 (36.4)	1 (9.1)	3 (27.3)	1 (9.1)	2 (18.2)
Alone	8 (34.8)	9 (39.1)	2 (8.7)	3 (13.0)	1 (4.3)

medicines (49.3%). To identify determinants of SM practice among the students of five universities of Baghdad, Rawa *et al.* performed logistic regression analysis and observed that neither age of the students nor their academic grade had any real association with SM.[26] The regional differences were also reported in two universities from Egypt. The prevalence of SM was estimated to be 79.5% among students of Alexandria

University, Egypt, and 62.9% in students from the University of Mansoura, Egypt.[3,14,23] A recently study conducted in a medical university of Islamabad Pakistan reported an SM prevalence of 77%.[27] The investigators from the above-cited study from Iraq argued that SM is high in Iraq as medicines, including antibiotics, can be easily procured from community pharmacies and other unauthorized outlets without medical prescriptions.

In the present study, the majority (48.9%) relied on the information received from the pharmacist with 44.7% and 16% of them had used OTC and prescription-only medicines, respectively. The pharmacy was their chief source of medicines (71.3%) and information (48.4%) about medicines. Our observation is in agreement with a previous study from Iraq, where the chief source of the information about medicines was from pharmacy.[26] Therefore, this is a serious issue and needs drafting strategies to curb the sale of medicines without a valid prescription.

Although most responders had indulged in SM last month, only very small numbers (8.5%) had practiced very frequently, and 39.9% reported practicing SM on rare occasions (once a month). This is in agreement with another study from Dammam, Saudi Arabia, where only 4.2% of the responders had practiced very frequently.[23]

In our study, minor ailments such as headaches, fever, pain, cold, flu, and dysmenorrhea were more frequently prevalent situations (about 70%) that required SM. In other studies, including the one from Iraq, these ailments had attracted SM by students, and the majority of students highlighted that such mild illnesses could be treated by SMs as it is mostly based on their previous experiences, self-knowledge, and advice by friends as well as family members. Although in this study, students were not asked whether the high cost was one of the factors for SM, many studies have cited this as one of the major parameters.[24,25] Nevertheless, long waiting time at physician's clinics was also one of the minor factors (3.7%) for practicing SM in this study as well as many others.[3,14,23,27] As opposed to this, 59% of students from one African university cited this as a reason for SM.[28] Surprisingly, only 4.8% ($n = 9$) had taken multivitamins in their SM practices in spite of the fact that 1.6% had reported paleness, and 0.5% had experienced a loss of weight.

Available medicines at home (23.9%) usually, leftover medicines were also an important source of medicines for SM in this study, as reported in other studies.[3,14,28] SM that involves the use of antibiotics is a serious health concern, as it increases the risk of antibiotics resistance.[29] Fortunately, in this study, only 11.6% of the respondents reported the use of antibiotics. SM varies with ethnicity, as observed in two studies from the UAE. One study found that 68.8% of Arabs practiced SM compared to 31.2% non-Arabs residing in UAE, whereas other studies reported 79.2% Arabs and 20.8% non-Arabs practiced SM.[30,31] A former study also reported a higher number of respondents from the medical field (68.8%) practiced SM compared to those from nonmedical fields (31.2%) in the general population. However, a study from Iraq reported that the prevalence of SM was also common in college students of arts, agricultural, business science, dentistry, education, engineering, law, medicine, pharmacology, political science, and science. This observation was based on a survey involving 1435 students from 5 universities in Iraq and showed that 92.45% of students practiced SM.[26]

In the present study, only 12.6% opined that self-knowledge is enough to self-medicate rationally. In contrast, surveys in the UAE showed that pharmacists do not regard health as a serious issue (42%), and 31% believed that their knowledge of drugs and diseases helps.[31,32]

In spite of being students of the 4th and 5th year of pharmacy course, nearly one-third of the respondents were not sure about reasons against or in favor of SM practices. This observation is similar to the study carried out in Dammam, Saudi Arabia, where 28.9% were not sure about reasons.[23]

In this study, the majority of students living with family had practiced SMs last month. A study has reported that students living with the family were 2 times more likely to practice SM than those living in other places (odds ratio = 2.501, $P = 0.037$).[26] However, the majority of these categories of students, as well as those living alone, viewed that they are against SMs and favors practicing in rare situations. In contrast, students living with friends favored SMs.

This is perhaps one of the initial studies from Iraq addressing the practice of SM among pharmacy students of the university. The study may help decision-makers in overcoming situations that favor the use of SMs. This study's significant strength is that it posed a questionnaire that addressed the most common and relevant issues in regard to SM practice. All questionnaires were validated by a team consisting of academicians, health practitioners, and pharmacists. The respondents were matured as they included students of the 4th and 5th years of preparatory years.

The study has some limitations, as it did not compile responses separately to those who practiced SM and those who did not. A comparison of responses between these two groups might have given a more relevant and statistically valid outcome.

CONCLUSIONS

Students of pharmacy have adequate knowledge of prescription and OTC drugs and their use in the treatment of various conditions. This could be a probable reason

for a high percentage of respondents (63.3%) practicing SM. A remarkable outcome of the survey is that SM was confined to common ailments (59%) with previous experience (11.7%), was not practiced very frequently (very frequently = 8.5%), and students had awareness about both ADR and the necessity of consultation with physicians or health-care providers. It is suggested that a larger study involving students of medical/paramedical fields and nonmedical should be initiated to compare views of students from two different backgrounds. The outcome of such a study may help public health-care authorities and academicians understand the prevalence of use and abuse of SMs. Based on the outcome of such a study, a policy may be drafted to create wide-scale awareness about the disadvantages of SMs, and legislation may be prepared to prevent the sale of medicines at local pharmacies and unauthorized outlets.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References

1. World Health Organization (WHO). The Safety of Medicines. World Health Organization (WHO); 2005.
2. Montastruc JL, Bagheri H, Geraud T, Lapeyre-Mestre M. Pharmacovigilance of self-medication. Therapie 1997;52:105-10.
3. Hanafy SA, Gad ZM, El Bourgy MD, Wahdan IH. Self-medication among Alexandria University students and effect of an educational intervention on their self-medication knowledge, attitudes and practices. Int J Comm Med Pub Heal 2020;7:1205-14.
4. 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. J Pak Med Assoc 2008;58:214-7.
5. Galato D, Galafassi LD, Alano GM, Trauthman SC. Responsible self-medication: Review of the process of pharmaceutical attendance. Braz J Pharm Sci 2009;45:626-33.
6. Ruiz ME. Risks of self-medication practices. Curr Drug Saf 2010;5:315-23.
7. Sarahroodi S, Arzi A, Sawalha AF. Antibiotics self-medication among southern Iranian university students. Int J Pharmacol 2010;6:48-52.
8. Abay SM, Amelo W. Assessment of self-medication practices among medical, pharmacy, and health science students in gondar university, ethiopia. J Young Pharm 2010;2:306-10.
9. Abbas A, Ahmed FR, Rizvi M. Evaluation of drug dispensing practices by pharmaceutical drug retailers in Pakistan. World J Pharm Res 2015;4:189-97.
10. Stosic R, Dunagan F, Palmer H, Fowler T, Adams I. Responsible self-medication: Perceived risks and benefits of over-the-counter analgesic use. Int J Pharm Pract 2011;19:236-45.
11. Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self medication. Drug Saf 2001;24:1027-37.
12. Chalker J. Improving antibiotic prescribing in Hai Phong Province, Viet Nam: The "antibiotic-dose" indicator. Bull World Health Organ 2001;79:313-20.
13. Bassols A, Bosch F, Baños JE. How does the general population treat their pain? A survey in Catalonia, Spain. J Pain Symptom Manage 2002;23:318-28.
14. Helal RM, Abou-ElWafa HS. Self-medication in university students from the City of Mansoura, Egypt. J Environ Public Health 2017;2017:9145193.
15. Hong SH, Spadaro D, West D, Tak SH. Patient valuation of pharmacist services for self care with OTC medications. J Clin Pharm Ther 2005;30:193-9.
16. Singh I, Bard I, Jackson J. Robust resilience and substantial interest: A survey of pharmacological cognitive enhancement among university students in the UK and Ireland. PLoS One 2014;9:e105969.
17. Sawalha AF. A descriptive study of self-medication practices among Palestinian medical and nonmedical university students. Res Social Adm Pharm 2008;4:164-72.
18. Klemenc-Ketis Z, Hladnik Z, Kersnik J. Self-medication among healthcare and non-healthcare students at University of Ljubljana, Slovenia. Med Princ Pract 2010;19:395-401.
19. Burak LJ, Damico A. College students' use of widely advertised medications. J Am Coll Health 2000;49:118-21.
20. James H, Handu SS, Khaja KA, Sequeira RP. Influence of medical training on self-medication by students. Int J Clin Pharmacol Ther 2008;46:23-9.
21. Ghosh S, Vikas V, Gupta A. Evaluation of the practice of self-medication among college students in west Uttar Pradesh. Int J Pharma Prof Res 2010;1:14-8.
22. Hussain A, Khanum A. Self-medication among university students of Islamabad, Pakistan–A preliminary study. Southern Med Rev 2008;1:14-6.
23. Albusalih FA, Naqvi AA, Ahmad R, Ahmad N. Prevalence of self-medication among students of pharmacy and medicine colleges of a public sector university in Dammam City, Saudi Arabia. Pharmacy (Basel) 2017;5:E51.
24. Ahmed FT, Ali GY. Evaluation of self-medication among Iraqi pharmacy students. J Ideas Heal 2019;2:108-12.
25. Aljaouni ME, Hafiz AA, Alalawi HH. Self-medication practice among medical and nonmedical students at Taibah University, Madinah, Saudi Arabia. Int J Acad Sci Res 2015;3:54-65.
26. Al-Ameri RJ, Abd Al-Badri HJ, Lafta RK. Prevalence of self-medication among university students in Baghdad: A cross-sectional study from Iraq. East Mediterr Health J 2017;23:87-93.
27. Mushtaq M, Gul S, Naz F. The practice of self-medication among Pakistani university students. Pak J Pharm Sci 2017;30:1377-81.
28. Osemene KP, Lamikanra A. A study of the prevalence of self-medication practice among university students in southwestern Nigeria. Trop J Pharma Res 2012;11:683-9.
29. Piddock LJV. Reflecting on the final report of the O'Neill Review on Antimicrobial Resistance. Lancet Infect Dis 2016;16:767-8.
30. Abduelkarem AR, Othman AM, Abuelkhair ZM, Ghazal MM, Alzouubi SB, El Zowalaty ME. Prevalence of self-medication with antibiotics among residents in United Arab Emirates. Infect Drug Resist 2019;12:3445-53.
31. Sharif SI, Bugaighis LM, Sharif RS. Self-medication practice among pharmacists in UAE. Pharmacol Pharm 2015;6:428-35.
32. Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication. Geneva: World Health Organization; 2000. Available from: http://apps.who.int/medicinedocs/pdf/s2218e/s2218e.pdf 17. [Last accessed on 22 Nov 20].