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Original Research Article

Self-medication: a current self-care practice amongst tertiary college students

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ABSTRACT

Background: Self-medication is the action of taking medication without consulting a physician or healthcare professional. It is one element of self-care coupled with social support during unwellness and aid. Though advocated for by health promoters it has its own fair share of cons.
Methods: A descriptive cross-sectional study was conducted where a sample was obtained using published tables and simple random sampling technique was used to draw the sample from a population of 800 student's gaining a total sample of 267 and to account for non-response and loss 10% was added giving a total of 294 respondents.
Results: The prevalence was 82.6% (218) and the age group with the highest frequency of 77.4% was 19-21 years. The male prevalence was higher than for the female with 60.1% (131). The study revealed highest source of information to be pharmacist with 37.8%, highest source of medication was drug shops with 38.1%, highest used medication to be coughs and cold syrups with 78% (205). The reason for self-medication with the highest percentage was suffering from minor illness with 75.37% (199). The symptoms that are highly self-medicated for were coughs and cold (78.7%), pains and headaches (74.2%), stomach discomforts (72.4) and fever (70%).
Conclusions: This study revealed a high prevalence of self-medication with 82.6% among the students. Creating awareness, enforcing the laws, informing the relevant stakeholders on availability of medicines and sealing the loops on dispensing of medication could save a generation.

Keywords: Consultation, Health promoter, Pharmacy, Pharmacist, Self-care, Self-medication

INTRODUCTION

Self-medication is one sort of self-care with alternative forms as well as self-treatments not essentially with medication, social support throughout unwellness and aid.[1] Self-medication is that action of taking medication while not consulting a doctor or attention of skilled person. The planet Health Organisation self-medication pointers describes self-medication because the act of people treating symptoms and disorder that they'll simply recognise or continued to use a previous prescribed medication by a doctor to treat a continual unwellness or treating chronic condition.[2] It's going to conjointly entails getting over the counter medication, shopping for prescription medicines while no advise of a doctor or skilled health care personnel, getting ready seasoning concoctions and re exploitation of leftover medicines from previous prescriptions.[3] The foremost cited sources of the medications used for self-medication are drug retailers units (pharmacy), members of the family, friends, left over medicines, healer and ancient healers. School students are part of the foremost elite population and one cluster that may simply access the data regarding their health. Conjointly they are an enormous part of future generation that may seemingly influence their youngsters as stakeholders in problems touching their health and as future prescribers and health education promoters.[4]

Self-medication needs some information and data on the dose. The sources of this data include: pharmacists, internet, friends, seniors, textbooks, media advertisements amongst others. Self-medication will be useful if properly used.[2] It advantages incudes: the patron use his preferences, it will cure minor ailments, saves times and increase productivity wherever one doesn't have to be compelled to be absent at work or faculty, value effective since no medical consultation is needed or it's reduced, it's large to be used and offers a larger choice of treatment. At community level smart self-medication might save scarce medical resources that might be used on minor ailments, it might cut back the price of community health funded programmes i.e. for those exploitation insurance like National insurance funds (NHIF) kitty might cut back the price if they experienced effective self-medication.[5] Conjointly it increase accessibility of health care to folks living in remote and rural area unit and improve health care systems wherever the numbers of health care employees are shy.[2]

Despites all the advantages self-medication, it has potential risks to it users that includes: adverse drug effects, inappropriate treatment, misdiagnosis, delays in diagnosis serious health issues, patients being subjected to uncalled-for medications that will be harmful to their body organs, worsening of patients conditions and longer suffering time that slows down production.[6] Conjointly in step with World Health Organization alternative potential threats includes: failure to recognise adverse drug effects, risks of double medication, there is also wrong manner of administration of the medication, wrong alternative of medical aid, not realising medicine risks, not knowing contraindications, interactions, warnings and precautions indicated on the medication, inadequate or excessive dose, risks at work or sport, while usage, foods and medicines interactions, microbic resistance and one is also drug dependent and become a lover.[2] At community level inappropriate self-medication could lead to sparks of drug elicited illness and monetary losses because of prolonged suffering and alternative potential risks that will occur.[4]

This world fantastic is experienced in each developed and developing countries touching population of all ages from youngsters, students, mothers and elders.[7] The foremost normally used medication includes cough and customary cold preparations (home remedies), cough syrups, vitamins, iron and atomic number 20 supplements, antibiotics, analgesics, alimentary tract medication, anti-histamines, corticosteroid preparations, cephalalgia medicines, hypoglycemic medication and Antipyretics.[7-10] Most cited convectional and medicine (CAM) includes herbs, religious healing, cupping, treatment, myths and cauterisation.[10]

Several factors influence self-medication which has cultural sensitivity, economic concerns, social orientation, preferences, lifestyles and political ideologies that influences accessibility of medication.[11] Conjointly from the study it's clear that age, gender, family back ground, skilled standing and pharmaceutical company's promotion activities and media at massive influence self-medication. Alternative freelance issue for example occupation, multiplied info enabling shoppers to manage their conditions, Associate in Nursing and existence of chronic conditions had an influence on the practise.[10] Another study showed that youth from poor background with poor health standing and principally male who were disgruntled with health care facilities and employees were a lot of seemingly to practise self-medication.[12]

The prevalence of self-medication is worrisome with 2.9-3.7% causes of deaths in hospital being because of drug-drug interaction.[13] Many studies on students from totally different skilled back ground shows quite forbidding prevalence for instance 91.4% of the undergraduates and post graduates students had experienced self-medication before the study.[9] Self-medication study on Chitwan Medical school initial year students recorded a prevalence of eighty four per cent of that twenty one males participated recording 95.23% prevalence rate and 54 respondents were female students recording 79.6% prevalence rate.[15] Conjointly pharmacy graduate students experienced self-medication with sixty seven of the respondents self-news to own been exploitation of crocin medicine, 60.6% exploited cough and cold syrups and 29.8% exploited antibiotics without physicians consultation. Mostly sixty-eight per cent of those graduates felt there was no reason for consulting physicians for minor upset.[8] This is often simply a tip of ice berg and therefore the trends raise issues for the long run generation.

The aim of this study was to assess information, perspective and apply of self-medication to grasp why the trend keeps growing.

METHODS

A descriptive cross-sectional study was conducted on Jordan College of Technology students between the month of April and June 2019. The sample was obtained from exploitation revealed tables. From the exploitation revealed tables with a population of 800 students the sample was 267 respondents. To account for non-response and loss, 100 percent was adscititious giving a complete sample of 294 respondents. The response rate was eighty-nine. 98% which suggests 264 questionnaires were well crammed and their knowledge was analysed. Easy sampling technique was accustomed to draw the sample wherever all components had equal likelihood of being enclosed within the sample. The administrative and ethical approval was obtained from Jordan College of Technology Management and Independent Research Review Board respectively. The respondents consented by sign language after briefing by a knowledgeable scientist about the study purpose and therefore the advantage of the study. The respondents joined voluntarily and their confidentiality assured. All students

from Jordan College of Technology who consented were included for the study while those who did not consent and those from other tertiary colleges were excluded from the study. Semi structured self-administered questionnaires were used for knowledge assortment and were written in English. The form had four sections with section one having queries on social demographic characteristic, section 2 on self-medication information, section 3 on perspective and final section on the practice. The information from the form was fed into MS Stand out for organization and SPSS version twenty was accustomed for analysis data and do descriptive statistics i.e. mean, frequencies, percentages etc.

RESULTS

The socio demographic characteristics of the respondents are summarized in the Table 1 below (Table 1).

Table 1: Respondents socio-demographic characteristics n=264.

Variables		Frequency	Percentages
Sex	Male	144	54.55
	Female	120	45.45
Age (years)	15-17	27	10.2
	18-21	204	77.4
	22-24	22	8.3
	25-27	11	4.17
Residence	Rural	137	51.90
	Urban	127	48.10

From the table above the male respondents were more than the females with the males comprising of 54.55% (144) and the females having 45.45% (120). The minimum age considered was 15 since there were students who enrolled for technical courses immediately, they completed their class eight (primary school) and the maximum age considered was 27 years of age. The mean age of the students was 19.67 and SD of 2.23. The age group with the highest frequency was between 19-21 years comprising of 77.4% (204), the age group with the least frequency was 25-27 years with 4.17% (11) while age group 15-17 years had 10.2% (27) and 22-24 having 8.3% (22).

Table 2: Prevalence of self-medication n=264.

Self-medication for the last six months	Frequency	Percentage
Yes	218	82.6
No	46	17.4

The respondent self-reported on self-medication with 218 (82.6%) students having taken medicines without physicians' consultation for the last six months prior to the study. The remaining 46 respondents comprising of 17.4% had not taken any medication without consulting a health care professional or physician. Out of 218 who had practiced self-medication, 131 were males which were 60.1% and the females were 87 which comprised of 39.9%. This is shown in the table below (Table 2).

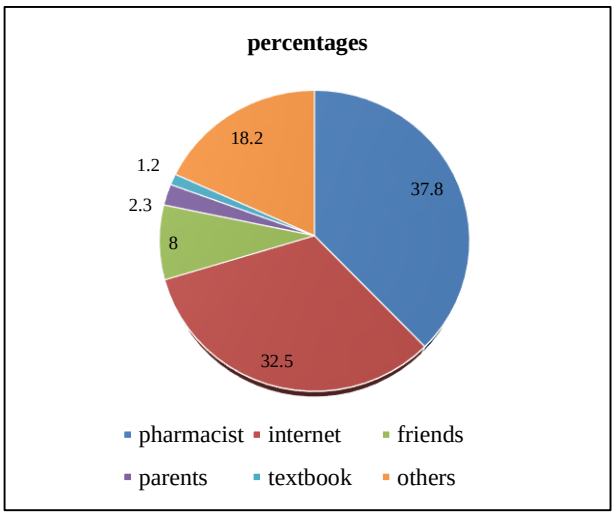

Figure 1: Sources of information for self-medication.

The respondents got information for self-medication from various sources i.e. 37.8% confirmed they obtained information from pharmacist, 32.5% from internet, 8.0% from friends, 2.3% from parents, 1.2% from textbooks and the rest 18.2% obtained information from other sources. This was summarized in the chart below (Figure 1).

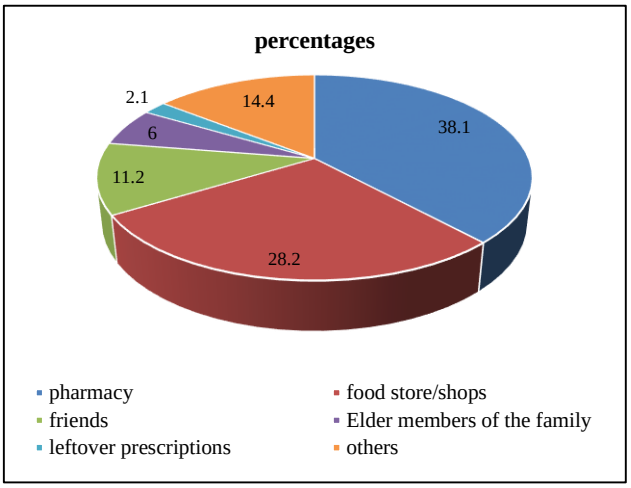

Figure 2: Sources of medicines for self-medication.

The sources of medication also varied greatly. The highest source that was reported was pharmacy or drug shops by 38.1% (100) of the respondents. Other sources were food stores or shops by 28.2% (74), friends by 11.2% (30), elder members of the family by 6.0% (16), previous prescribed left-over medicine by 2.1% and 14.4% (38) reported to have obtained their medication from unspecified sources or category others. This summary is shown below in the following chart (Figure 2).

Respondents' knowledge on self-medication

Table 3 presents the respondents' knowledge on self-medication.

Respondents attitude on self-medication

Table 4 shows the attitude of respondents' towards self-medication.

Table 3: Respondents knowledge (n=264).

Statement	Responses				
	Very much (%)	Much (%)	Some (%)	A little (%)	Not at all (%)
What is self-medication?	16 (6.0)	13 (4.7)	208 (78.9)	18 (7.0)	9 (3.4)
Knowledge about					
Adverse drug effects	4 (1.7)	3 (0.9)	13 (5.1)	32 (12)	212 (80.3)
Drug dosage	152 (57.6)	44 (16.7)	28 (10.6)	24 (9.1)	16 (6.0)
Double medication	5 (2.0)	22 (8.2)	33 (12.5)	54 (20.4)	150 (56.9)
Dosage completion	64 (24.2)	108 (40.9)	42 (15.9)	29 (11)	21 (8)
Misdiagnosis	54 (20.4)	46 (17.3)	10 (3.8)	27 (10.2)	127 (48.2)
Contraindications, interactions, warnings and precautions indicated on the drugs	102 (38.6)	48 (18.2)	10 (3.8)	77 (29.2)	27 (10.2)
Wrong choice of therapy	100 (37.9)	64 (24.2)	27 (10.2)	45 (17)	28 (10.6)
Prolonged suffering	24 (9.2)	32 (12)	31 (11.7)	96 (36.3)	81 (30.8)
Knowledge on					
Antibiotics	16 (6.1)	33 (12.5)	140 (53.0)	54 (20.4)	21 (8.0)
Analgesics	27 (10.2)	35 (13.2)	32 (12.2)	61 (23.2)	109 (41.2)
Cough and cold syrups	46 (17.3)	127 (48.2)	54 (20.4)	27 (10.2)	10 (3.8)
Vitamins and mineral supplements	19 (7.3)	38 (14.3)	68 (25.7)	78 (29.5)	61 (23.2)
Antacids	37 (14.2)	113 (42.8)	40 (15.2)	45 (17)	29 (10.8)
Migraine medicines	38 (14.3)	141 (53.4)	58 (22.0)	16 (6.1)	11 (4.2)
Antipyretic	5 (2.0)	23 (8.6)	33 (12.6)	54 (20.4)	149 (56.4)
Herbal	35 (13.2)	45 (17.2)	101 (38.2)	61 (23.2)	22 (8.2)

Table 4: Respondents attitude on self-medication.

Statement	Responses				
	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
One should read instructions on labels carefully	16 (6.1)	20 (7.5)	14 (5.3)	28 (10.6)	186 (70.4)
Students should not consult physicians	98 (37.1)	74 (28.0)	0 (0)	32 (12.1)	60 (22.7)
One should get medication from friends and elder members of the family	106 (40.2)	58 (21.9)	12 (4.5)	20 (7.6)	68 (25.8)
Self-medication can be harmful to one health	38 (14.3)	32 (12.1)	24 (9.2)	48 (18.2)	122 (46.2)
Medication dosage should be completed even if symptoms disappear	112 (42.4)	26 (9.8)	32 (12.1)	48 (18.2)	46 (17.4)
One should be careful with prescription medicine only	52 (19.7)	18 (6.8)	48 (18.2)	30 (11.4)	116 (43.9)
Self-medication can save public fund if used appropriately	78 (29.5)	30 (11.4)	34 (12.9)	46 (17.4)	76 (28.8)
People dispensing medicine should be licensed	37 (14.0)	51 (19.3)	11 (4.2)	73 (27.7)	92 (34.8)
One can always use previously prescribed left-over medicine	96 (36.4)	32 (12.1)	46 (17.4)	41 (15.5)	49 (18.6)

Self-medication practice

The prevalence of self-medication was 82.6% for the last six months prior to study period. The most disorders and symptoms that the respondents self-treated were as follows. Colds and coughs self-medication was 78.7% (208), pains and headaches was 74.2% (196), stomach discomforts were 72.4% (191), fever was 70% (185), dysmenorrhoea was 24% (63) and others was 38.6% (102). This was summarized in the graph below (Figure 3).

The commonly used drugs for medication by the respondents were as follows. Coughs and cold

preparations (home remedies) usage was self-reported by 68.56% (181) of the respondents, cold and cough syrups by 78% (205), gastrointestinal tracts drugs was 70.4% (186), antibiotics was 52.7% (139), anta-acids was 52.2% (138) analgesics was 75.5% (200), migraine medicine was 76.5% (202), herbal was at 20.4% (54) and other unspecified drug types was at 27.6% (73). This was summarized in the graph below (Figure 4).

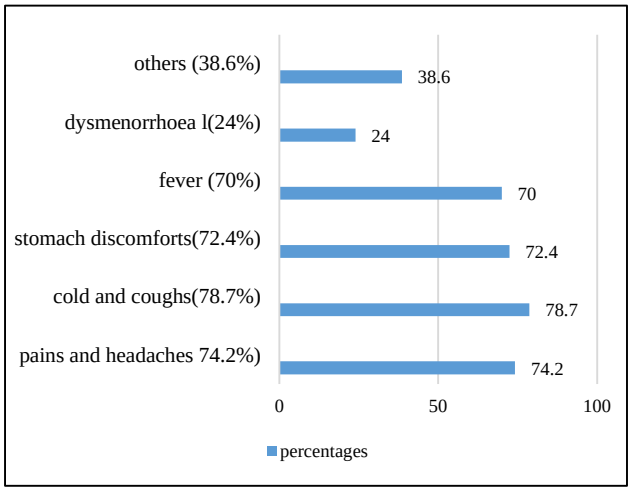

Figure 3: Diagnosis for self-medication.

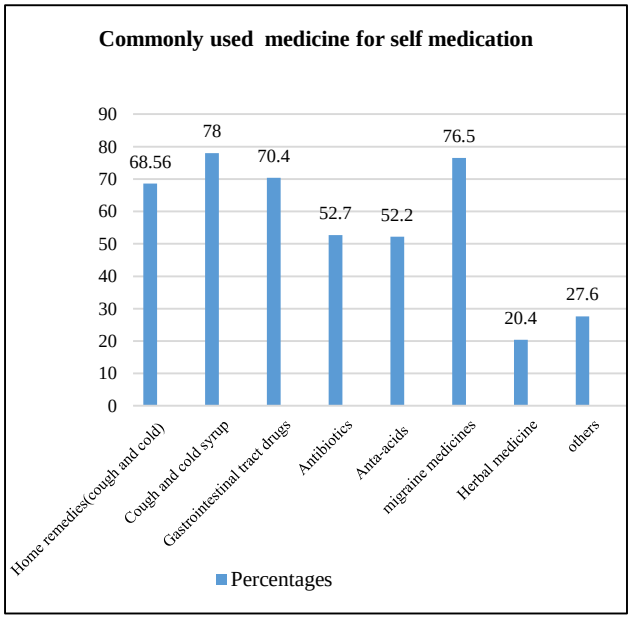

Figure 4: Types of drugs commonly used.

Several reasons were cited for self-medication. From the respondents, (70.1%) 185 stated that the practice was time saving since they dint have to go to the hospital which made sure they attended school. Also 68.56% (181) said it had worked for them before and they got well, for small (minor) illness it was 75.37% (199), for emergency reasons was 50.27% (133), for cheap it was 20.1% (53) and for convenient since pharmacies were all over and they could easily access information from internet was 56.43% (149) amongst others. This information is summarized below in ascending order. Table 5.

Table 5: Reasons for self-medication.

Reason for self-medication	Frequency	Percentage
Small (minor) illness	199	75.37
Time saving	185	70.1
Worked previously	181	68.56
Convenient	149	56.43
Emergency response	133	50.37
Cheap	53	20.1

DISCUSSION

The male respondents were more than the female where the male comprised of 54.55% and the rest 45.45% were female. This could mean that more male students were able to learn and enrol in technical colleges than females who could have dropped out of school, married early or who prefer to enrol on other social science courses than technical courses. The prevalence of self-medication was reported to be 82.6% (218). This finding from this study is similar with finding of Ehigiator et al which recorded a high prevalence of 92% on self-medication on undergraduate students.[14] The age group with the highest frequency was between 18-21 years with 77.4% of the participant which could be attributed to the most appropriate age of college students.

From the respondents the male prevalence of self-medication was 60.1% (131) and 39.9% (87) were females this indicates that males' prevalence of self-medication is higher than females which could be attributed to poor health seeking behaviour in men who rarely seek medical assistance in medical facilities preferring over the counter drugs. A previous study exhibited different result reporting that female students had higher prevalence of self-medication than the males thou the study was limited to antibiotics and antimalarial drugs.[9]

The leading source of information for the self-medication by the respondents was from pharmacist with 38.1% this could be explained in that pharmacy/drug shops are the first point where the students got their medication. This is reflected by a study in 2013 which reported the leading source of information to be from pharmacists with 49.68%.[15] From the respondents 1.2% obtained information from textbooks which could be attributed to students' poor reading behaviour which is on the contrary with a study in 2013 which reported the use of textbooks to be 46.03%.[15] The highest source of medicines used for self-medication was reported to be from pharmacy or drug shops which was 38.1% (100) and the least was from prescribed left over drugs with 2.1% (6). This finding portrays a loop on drug distribution where the

society are able to get drugs without prescription from the pharmacy or drug shops which could poses a public health problem. Also, by having left over prescribed drugs in homes is a clear indication that people don't adhere to drug dosage which could contribute to drug resistance which is a current health problem.

The respondent knowledge assessment on self-medication showed that 78.9% of the respondent has some knowledge on self-medication. On adverse effects of drugs on self-medication, 80.3% did not have any knowledge on adverse effects. From the results 57.6% of the respondents were aware of dosage and adherence, 48.2% and 56.9% did not have knowledge on misdiagnosis and double medication respectively. On types of drugs 53.0% had some knowledge on existence of anti-biotics, 41.2% did not know existence of analgesics, 48.2% had much knowledge on existence of coughs and cold syrups, 25.7% had some knowledge on vitamins and mineral supplements, 42.8% had much knowledge on antacids, 53.4% had much knowledge on migraine medicines, 56.4 didn't have any knowledge on antipyretics and 38.2% had some knowledge on herbal medicine.

The highest self-medicated conditions were colds and coughs with 78.7% (208). This is similar with a study done on 2015 which reported 85.7% of the most self-treated conditions were coughs and colds.[16] The commonly used drugs for self-medication by the respondents were coughs and cold preparations (home remedies) with 68.56% (181) and cold and cough syrups with 78% (205) of the respondents. Several reasons were given for self-medication with minor illness leading with 75.37% followed by other reasons like time saving, worked previously, convenient, emergency response and that self-medication is cheap compared to going to a health facility where you have to pay consultation fees and still buy medicines.

The respondents' attitude was positive with 70.4% strongly agreeing one should read instructions on labels carefully before self-medication. From the respondents 37.1% strongly disagreed those students should not disagree. Most of the respondents 40.2% strongly disagreed that one should get medicine from elder members of the family, friends and relative. Most of the respondents 46.2% strongly agree that self-medication can be harmful to one's health. Medication dosage should be completed even if symptoms disappear was strongly disagreed by 42.4% which is a clear indication that most of the respondents didn't clear their medication which can easily cause drug resistant.

The prevalence of self-medication was 82.6% for the last six months prior to study period. The symptoms and signs that were self-medicated for are colds and coughs with 78.7% (208), pains and headaches (74.2%), stomach discomfort (72.4%) and fever (70%). This high percentage was also reported by Mehta et al which was 85.7% for colds and coughs, 76.2% for pains and 73% for fever.[16] Colds and coughs self-medication was 52.5%, pains (54%) and fever was 48.72% though relatively lower compared to the study by Pandya et al.[17] The highest medication used for self-medication was colds and coughs syrups with 78% and home remedies (cold preparations) for cold was 68.56% with migraine medicine being 76.5% (202) which was among the highest. This high usage of cold and cough syrups, cold preparations and migraine medicine could be associated with the highest most self-medicated symptoms that includes colds and coughs and pains and headaches.

CONCLUSION

Though self-medication is one of self-care aspects it has its own pros and cons. Some of its pros are that you are in control of choices of therapies, it is time saving since no queuing, cheaper since no consultation fees to the physicians and at community level it could save scarce medical resources which could have been used on minor ailments and it can reduce the cost of community health funded programmes. Besides the pros, are the cons which include missed diagnosis, prolonged suffering, drug resistance, doubles medication amongst others. This study set to assess the prevalence of self-medication on technical college students and it was found to be very high with 82.6% (218). This study also revealed that male students had higher prevalence of self-medication than the females which was at 60.1%. The highest source of information for self-medication was from the pharmacists and the highest source of self-medication was from the drug shops (pharmacy). The highest self-medicated conditions were colds and coughs with 78.7% (208) and also the medication with the highest percentage was colds and cough syrups coupled with home remedies for coughs and colds. The reasons why people practised self-medication suffering from minor (small) illnesses had the highest percentage of 75.37% (199).

This study chose students since they form part of the most elite population and one group that can easily access the information pertaining their health. Also they form a huge population that can easily influence future health behaviour of a population and can be big crusaders and promoters of healthy behaviour in future to their children and population at large. By the fact that this study reveals a high prevalence of self-medication, creating awareness, informing policy makers in issues of availability of drugs and sealing the loop holes on medicine dispensing could save a generation.

Recommendations

This study was limited to a single setting hence would recommend a comparative study to other scientists who could be interested in the topic. The study focused on tertiary college students but self-medication is a global issue of health concern hence the topic can be done on any population from infants to the elderly. A lot of

emphasis is needed on the impact of self-medication through public health promotion education, campaigns and any other intervention models could be developed that would aim at reducing self-medication amongst the tertiary college students and communities at large.

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REFERENCES

1. Kayalvizhi S, Senapathi R. Evaluation of the perception, attitude and practice of self-medication among business students in 3 select cities, South India. Int J Enterprise Innov Manage Stud. 2010;1(3):40-4.
2. World Health Organization. Guidelines for the regulatory assessment of medicinal products for use in self-medication. World Health Organization. 2000. Available from: https://apps.who.int/iris /handle/10665/66154. Accessed on 1 May 2019.
3. Awad A, Thalib L, Matowe L. Self-medication with antibiotics and antimalarials in the community of Khartoum State, Sudan. J Pharm Pharm Sci. 2005;8(2):326-33.
4. Gupta S, Jindal M. Study of self-medication pattern in undergraduate student of Subharti Medical College, Meerut (UP). J Adv Res Biol Sci. 2013;5(3):266-70.
5. Pagan JA, Ross S, Yau J, Polsky D. Self-medication and health insurance coverage in Mexico. Health Policy. 2006;75(2):170-7.
6. Awatif Ahmed Osman AA. Self-medication. Sudan J Ration Use Med. 2014;1-30.
7. Bennadi D. Self-medication: A current challenge. J Basic Clin Pharm. 2013;5(1):19-23.
8. Ritu P, Himmat S, Manisha R, Gaurav G, Priya B. An online exploratory study of self-medication among pharmacy graduates in India. Int J Drug Dev Res. 2011;3(4):200-7.
9. Osemene KP, Lamikanra A. A study of the prevalence of self-medication practice among university students in Southwestern Nigeria. Trop J Pharm Res. 2012;11(4):683-9.
10. El Nimr NA, Wahdan IM, Wahdan AM, Kotb RE. Self-medication with drugs and complementary and alternative medicines in Alexandria, Egypt: prevalence, patterns and determinants. East Mediter Health J. 2015;21(4):256-65.
11. Sarahroodi S, Arzi A, Sawalha AF, Ashtarinezhad A. Antibiotics self-medication among Southern Iranian university students. Int J Pharmacol. 2010;6(1):48-52.
12. Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self-medication. Drug Safety. 2001;24:1027-37.
13. LB., L. (2000). Medication error. An expose of the medical problem. http://www.google.com.
14. Ehigiator O, Azodo CC, Ehizele AO, Ezeja EB, Ehigiator L, Madukwe IU. Self-medication practices among dental, midwifery and nursing students. Eur J Gen Dentist. 2013;2(01):54-7.
15. Wajantri p., A. M. (2013). A Study on Knowledge, Attitude and Practice about Self Medication among College Students. International Journal of Health Sciences & Research, 2249-9571.
16. Mehta RK, Sharma S. Knowledge, attitude and practice of self-medication among medical students. IOSR J Nurs Health Sci. 2015;4(1):89-96.
17. Pandya RN, Jhaveri KS, Vyas FI, Patel VJ. Prevalence, pattern and perceptions of self-medication in medical students. Int J Basic Clin Pharmacol. 2013;2(3):275-80.

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