

Self-medication among non-healthcare students of the University of Sharjah, United Arab Emirates

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ABSTRACT

Objectives: The objective of the following study is to estimate the prevalence of self-medication among university students and evaluate factors associated with the practice.

Materials and Methods: This study was conducted during May, 2012 using a pre-validated questionnaire distributed to 250 students of the 4 years of study at the college of business administration. Data were analyzed using PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc and results are expressed as counts and percentages. Chi-square test was used to evaluate significant association among the study variables and $P < 0.05$ were considered to be statistically significant.

Results: The response rate was 80% and all respondents were Arabs with 114 (57%) females and 86 (43%) males. Self-medication was practiced by 118 (59%) students and most (88.1%) of them obtained medications from pharmacies. About 21 (11%) respondents self-medicated with antibiotics. Only 34 (17%) and 16 (8%) of respondents were aware of bacterial resistance and rational drug use respectively. The most common reasons for self-medication were seeking quick relief (134, 67%), physician's advice of self-management (100, 50%), illness is minor (91, 45.5%). Common reasons against self-medication include risk of misdiagnosis of illness (160, 80%), risk of using the wrong medication (154, 77%), risk of adverse effects (140, 70%). Self-medication was practiced for headache or mild pain, eye and ear symptoms, gastric problems, cold, fever and allergy.

Conclusion: Self-medication among non-healthcare students is common with high prevalence. Knowledge of students of reasons for and against self-medication was adequate, but awareness of respondents of rational drug use and risk of bacterial resistance in response to misuse was poor. Orientation courses/workshops directed to university students would be beneficial.

Key words: Non-health care, self-medication, university students

INTRODUCTION

As a component of self-care,^[1,2] self-medication allows patients to take responsibility of their own health particularly with minor complaints.^[3] Self-medication with prescription and/or over-the-counter (OTC) drugs is common among

university students. The practice also encompasses the use of herbal medicines.^[4] The World Health Organization supports responsible self-medication as it economizes on both the individual and the health care system.^[5]

Among prescription drugs, antibiotics are also used for self-medication and misuse of such drugs may lead to the emergence of bacterial resistance.^[6-8] Irrational self-medication may have many undesirable consequences such as worsening of the condition, appearance of adverse effects, polypharmacy, drug interaction and drug abuse. However, the appropriate self-use of OTC drugs to conditions for which they are necessary may be a form of responsible

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self-medication particularly when based on a certain level of knowledge by the user.^[9,10]

It has been frequently reported that in different populations, university students use self-medication very often,^[6,11-13] and the incidence of self-medication among students is higher than in the general population.^[11,13,14] Recently, we demonstrated that pharmacy students practice self-medication mainly because their health problem is not serious and also because they seek quick relief.^[6] Medical knowledge about diseases and medication has been shown to influence self-medication practice.^[11,13,15] Other factors have reported to influence self-medication include age, gender, family and professional status, availability of drugs and pharmaceutical promotional activities.^[6-19] It has also been reported that high level of education and knowledge of drugs and their a clinical indications^[6,20,21] contribute to the increased trend of self-medication. Therefore, the present study was undertaken to investigate the practice of self-medication among non-healthcare university students who represent a large proportion of the community if not community at large when their influence on their families is also considered. We also assessed the significant association among the study variables.

MATERIALS AND METHODS

This anonymous questionnaire-based study was carried out in May, 2013, using a pre-validated questionnaire consisting of both open-ended and closed-ended item as modified from questionnaires used by other investigators.^[12,18] The study was approved by the research and Ethics Committee of the Colleges of Medicine and Health Sciences, University of Sharjah, United Arab Emirates (UAE). Prior to commencement of data collection, the study questionnaire was pretested with 10 respondents to evaluate its validity and comments received were taken into consideration in the reconstructed questionnaire. The questionnaire was in English and it was distributed to a total of 250 students of the 4 years of study of the college of business administration at the University of Sharjah, UAE. The nature of the study was explained to all students in classrooms. On average, the questionnaire was completed in 15 min. The use of a prescription or OTC drugs without medical consultation was considered as self-medication. Students were asked to report self-medication during the previous (2012) year.

The questionnaire contained questions covering demographic information namely age, sex and nationality and questions focusing on self-medication. The latter questions covered self-medication practice, types of self-medications used and their sources, duration of use, reasons for and against self-medication and reasons for seeking medical consultation. The questions also addressed approval or disapproval of students of statements on some aspects of use of drugs for self-medication. Statistical analysis was performed using SPSS version 18. Data were summarized as counts and percentages. Chi-square test was used to evaluate significant association among the study variables and $P < 0.05$ were considered to be statistically significant.

RESULTS

The response rate was 80% and all respondents were Arabs with 114 (57%) females and 86 (43%) males. The mean age \pm SD was 20.4 ± 2.6 . Self-medication during the year 2012 was practiced by significantly large number (118, 59%, Chi-square: 6.480^a, df: 1, $P < 0.01$) of students. Most respondents (105, 53%) used drugs for self-medication for a period of 1-2 weeks while for very few (13, 7%) respondents, self-medication lasted for a month or even more [Table 1]. The majority of students (98, 49%, Chi-square: 140.200^a, df: 3, $P < 0.001$) obtained their medication from pharmacies. Other sources for obtaining non-prescription drugs include street market (13, 7%), herbal store (3, 2%) and a relative or friend (4, 2%). Significantly low number (21, 11%, Chi-square: 121.680^a, df: 1, $P < 0.001$) of respondents used antibiotics for self-medications. Only 34 (17%) and 16 (8%) respondents were aware of bacterial resistance and rational drug use respectively. Table 2 reveals that the most common reasons for self-medication include seeking quick relief (134, 67%), physician's advice of self-management (100, 50%), illness is minor (91, 45.5%), personal convenience (76, 38%), health problem is not serious (67, 33.5%) and high cost of medical consultation (65, 33%). Significantly (Chi-square: 3.091^a, df: 1, $P < 0.05$) more females selected the option health problem is not serious, but no significant differences were observed between males and females with regard to other reasons for self-medication.

Table 3 shows reasons against self-medication which include risk of misdiagnosis of illness (160, 80%), risk of using the wrong medication (154, 77%), risk of adverse effects (140, 70%), risk of drug interaction (78, 39%) and risk of drug abuse and

dependence (46, 23%). Significantly more female than male respondents selected the various reasons against self-medication ($P < 0.001$).

Table 1: Self-medication practice by non-healthcare university students during 2012

N=200	Frequency (%)	Chi-square	df	P value
Did you use self-medication in the past year?				
Yes	118 (59)	6.480 ^a	1	0.01
No	82 (41)			
How long the treatment was used?				
1 week	59 (30)	71.320 ^a	3	0.001
2 weeks	46 (23)			
1 month	7 (4)			
Longer than a month	6 (3)			
Where from you obtained self-medication?				
Pharmacy	98 (49)	140.200 ^a	3	0.001
Street market	13 (7)			
Herbal store	3 (2)			
Relative/friend	4 (2)			
Antibiotic obtained as self-medication				
Yes	21 (11)	121.680 ^a	1	0.001
No	179 (90)			
Duration of use				
1 week	19 (10)	276.610 ^b	2	0.001
2 weeks	2 (1)			
Awareness of bacterial resistance				
Aware	34 (17)	87.120 ^a	1	0.001
Not aware	166 (83)			
Awareness of rational drug use				
Aware	16 (8)	141.120 ^a	1	0.001
Not aware	184 (92)			

^{a,b}=Chi-square only indicate comparison between two variables

Table 3 also shows that worsening of symptoms (71, 35.5%), presence of pain (69, 34.5%) and ineffectiveness of usual treatment (46, 23%) were the main reasons that forced female respondents to seek medical consultation. The only difference from the female's responses is that male respondents selected as a third option side-effects of usual treatment. Large numbers of respondents approved all statements on aspects of self-medication practice [Table 4]. No significant differences were observed between male and female students except with regard to statements including decreasing drug dose can be dangerous, no drug can be used during pregnancy and mild medical problems do not require drug treatment where responses of female students were significantly higher than those of male students.

Headache or mild pain, eye and ear symptoms, gastric problems, cold, fever and allergy were the symptoms for which self-medication was practiced. The most common drugs used for self-medication were analgesics, antiemetics, eye drops, nasal decongestans and vitamins and minerals.

DISCUSSION

All participants in the present study were Arabs of different nationalities, but with common socio-cultural and educational background as the majority of them were born/raised in UAE and are either nationals or expatriates residing in one of the seven emirates of the country.

Self-medication among non-health care students though seems to be a common practice but with a lower prevalence than previously reported in

Table 2: Gender based reasons for self-medication by university non-healthcare students

Reason	Frequency (%), N=200			Chi-square	df	P value
	Male	Female	Total			
Health problem is not serious	23 (34.3)	44 (65.7)	67 (33.5)	3.091 ^a	1	0.05
Seeking quick relief	62 (46.3)	72 (53.7)	134 (67)	2.318 ^a	1	0.31
Personal convenience	29 (38.2)	47 (61.8)	76 (38)	1.173 ^a	1	0.18
Avoidance of long waiting at clinics	15 (46.9)	17 (53.1)	32 (16)	0.233 ^a	1	0.39
High cost of medical consultation	30 (46.2)	35 (53.8)	65 (33)	0.391 ^a	1	0.32
Suggestion of a relative/friend	21 (46.7)	24 (53.3)	45 (23)	0.319 ^a	1	0.35
Learning opportunity	1 (33.3)	2 (66.7)	3 (1.5)	1.442 ^a	2	0.49
Self-need to play active role	14 (46.7)	16 (53.3)	30 (15)	0.194 ^a	1	0.40
Physician's advice of self-management	40 (40)	60 (60)	100 (50)	0.734 ^a	1	0.24
Physician prescription was not effective	18 (52.9)	16 (47.1)	34 (17)	1.652 ^a	1	0.14
I do not trust my physician	12 (35.3)	22 (64.7)	34 (17)	0.992 ^a	1	0.21
Illness is minor	42 (46.2)	49 (53.8)	91 (45.5)	0.678 ^a	1	0.25
Embarrassed of discussing own symptoms	13 (39.4)	20 (60.6)	30 (15)	0.678 ^a	1	0.40

^a=Chi-square only indicate comparison between two variables

Table 3: Gender based reasons against self-medication and for seeking professional help by university non-healthcare students

Reason	Frequency (%), N=200			Chi-square	df	P value
	Male	Female	Total			
Reasons against self-medication						
Risk of adverse effects	61 (43.6)	79 (56.4)	140 (70)	32.000 ^a	1	0.001
Risk of using wrong medication	65 (42.2)	89 (57.8)	154 (77)	58.320 ^a	1	0.001
Risk of misdiagnosis of illness	72 (45)	88 (55)	160 (80)	72.000 ^a	1	0.001
Risk of drug interaction	37 (47.4)	41 (52.6)	78 (39)	9.680 ^a	1	0.001
Risk of drug abuse and dependence	19 (42.2)	26 (57.8)	46 (23)	60.500 ^a	1	0.001
Reasons for seeking professional help						
Presence of severe pain	32 (46.4)	37 (53.6)	69 (34.5)	0.490 ^a	1	0.29
Symptoms last for more than 1 week	8 (28.6)	20 (71.4)	28 (14)	2.765 ^a	1	0.07
Symptoms are worsening	34 (47.9)	37 (52.1)	71 (35.5)	1.073 ^a	1	0.19
Thinking the problem is serious	18 (48.6)	19 (51.4)	37 (19)	0.591 ^a	1	0.28
Usual treatment is not effective	17 (37)	29 (63)	46 (23)	0.890 ^a	1	0.22
Side effects of usual treatment	20 (66.7)	10 (33.3)	30 (15)	8.066 ^a	1	0.004
In case of mental problem	0 (0)	0 (0)	0 (0)	0.0 ^a		

^a=Chi-square only indicate comparison between two variables

Table 4: Responses of non-healthcare university students to some aspects of self-medication

Reason	Number of respondents (%), n=200			Chi-square	df	P value
	Male	Female	Total			
All medications (prescription, OTC and herbal) have adverse effects						
Approve	71 (43)	94 (57)	165 (83)	0.000 ^a	1	0.57
Disapprove	15 (42.9)	20 (57.1)	35 (18)			
Concomitant use of drugs can be dangerous						
Approve	66 (44)	84 (66)	150 (75)	0.245 ^a	1	0.37
Disapprove	20 (40)	30 (60)	50 (25)			
Increasing drug dose can be dangerous						
Approve	52 (43.3)	68 (56.7)	120 (80)	0.014 ^a	1	0.51
Disapprove	34 (42.5)	46 (57.5)	80 (20)			
Decreasing drug dose can be dangerous						
Approve	41 (35.7)	74 (64.3)	115 (85)	5.961 ^a	1	0.01
Disapprove	45 (52.9)	40 (47.1)	85 (15)			
In case of adverse effects physician help must be sought						
Approve	86 (43.2)	113 (56.8)	199 (99.5)	0.758 ^a	1	0.57
Disapprove	0 (0)	1 (100)	1 (0.5)			
Using medications with unknown substances in patients with liver and kidney disease is dangerous						
Approve	42 (41.6)	59 (58.4)	101 (50.5)	0.167	1	0.40
Disapprove	44 (44.4)	55 (55.6)	99 (49.5)			
No drug can be used during is dangerous pregnancy						
Approve	44 (37.6)	73 (62.4)	117 (58.5)	3.346 ^a	1	0.05
Disapprove	42 (50.6)	41 (49.4)	83 (41.5)			
Mild medical problems do not require drug treatment						
Approve	49 (38.3)	79 (61.7)	128 (64)	3.230 ^a	1	0.05
Disapprove	37 (51.4)	35 (48.6)	72 (36)			
Self-medication can mask signs and symptoms of disease so the physician can overlook them easily						
Approve	46 (38.3)	74 (61.7)	120 (60)	2.666 ^a	1	0.07
Disapprove	40 (50)	40 (50)	80 (40)			

OTC=Over-the-counter, ^a=Chi-square only indicate comparison between two variables,

pharmacy students of the same university.^[6] Results of the present study indicate that the prevalence of

self-medication amongst university students is much lower than in other countries 76% in Pakistan,^[17] 88%

in Croatia,^[10] 94% in Hong Kong,^[13] 85% in Malaysia^[22] and 98% in Palestine.^[16]

Most respondents used self-medication for a period of 1-2 weeks. However, about 7% of self-medicated with drugs for a month and longer. This is alarming as such longer periods of self-medication may point at the possibility of misdiagnosis or the use of the wrong medication.

Previous studies reported no significant differences in prevalence of self-medication between healthcare and non-health care students.^[17,18,23,24] Our present results do not support these findings since the practice is significantly lower in non-health care than health care students.^[6] It is worth noting that in Brazil, pharmacy students have also been shown to practice self-medication more than do medical and other paramedical students and it has been suggested that this may be attributable to a deeper knowledge on medicines gained by pharmacy students.^[25]

Higher prevalence of self-medication in healthcare students may be attributed to knowledge of drugs, their uses and adverse effects although the practice itself may not always be a responsible one. Heavy load of drug-related courses in pharmacy would certainly empower student's knowledge and confidence in their ability to self-management but it does not always lead to rational use of self-medication. This point is further supported by our observation that, significantly less number of non-healthcare students self-medicated with antibiotics as compared to healthcare students in Iran,^[8] UAE,^[26] Jordan^[27] and USA.^[28] This is rather surprising in the light of finding that in the present study awareness of non-healthcare students of the possible emergence of bacterial resistance and also of rational drug use was significantly markedly poor. Interventions directed to increase public awareness to rational use of drugs should be enhanced. Moreover, the unsolicited misuse of antibiotics should be discouraged.

Our results with regard to reasons for and against self-medication were in good agreement with those reported earlier.^[6,16,18,29,30] We also observed that the most common reasons for both male and female respondents to seek medical consultation include worsening of symptoms, presence of severe pain, ineffectiveness of the usual treatment and side effects of the drug used for self-medication.

Results of the present study were essentially the same regardless of gender except for reasons against self-medication where more female than male

respondents selected these reasons. In general, our results were indicate an adequate knowledge of participants with regard to benefits and risks of self-medication.

Knowledge of respondents was also adequate with regard to drug adverse effects, concomitant use of drugs, risk of increasing or decreasing the dose, the need to seek physician help in case of adverse effects, using medications in the presence of kidney or liver diseases, use of drugs during pregnancy, self-management of minor problems and the possibility that self-medication may mask signs and symptoms of illness and complicate diagnosis. However, significantly larger number of female than male respondents approved that lowering drug dose is dangerous, no drugs can be used during pregnancy and mild health problems do not require drug treatment. Such differences may point at a better knowledge and more cautious perception of females as compared to male students.

Symptoms for which self-medication was practiced include headache or mild pain, eye and ear symptoms, gastric problems, cold, fever and allergy and the most common drugs used for self-medication were analgesics, antiemetics, eye drops, nasal decongestans and vitamins and minerals. These findings are in accordance with those of other studies.^[6,18,21]

Our results indicate that self-medication is common among non-healthcare university students regardless of the fact that those students have an adequate knowledge of benefits and risks associated with the practice. Such knowledge is probably gained through other than university educational courses. Interventions through workshops, seminars, campaigns and university elective courses may help in enforcing rational self-medication practice among university students.

Study limitations

This study was conducted using nonrandom sampling of the Sharjah-university students and as such generalization of drawn conclusion on all university students may not be valid. In the present study, students are also assumed to remember practicing self-medication through a previous year thus it might be advisable in future work to also evaluate the frequency of self-medication and reduce the period of practice to the nearest 3-6 months.

CONCLUSION

Results of the present study indicate that self-medication is common among non-healthcare

university students and its prevalence is high. Knowledge of students of benefits and risks of the practice is adequate and also their perception of when to seek medical consultation. However, more efforts are needed to increase awareness of students of responsible self-medication.

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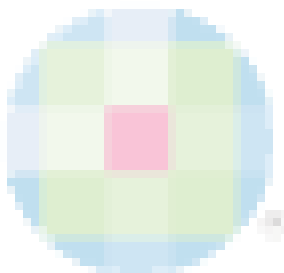
REFERENCES

- Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self medication. *Drug Saf* 2001;24:1027-37.
- Multicenter study on self-medication and self-prescription in six Latin American countries. Drug Utilization Research Group, Latin America. *Clin Pharmacol Ther* 1997;61:488-93.
- Porteous T, Bond C, Hannaford P, Sinclair H. How and why are non-prescription analgesics used in Scotland? *Fam Pract* 2005;22:78-85.
- Shankar PR, Partha P, Shenoy N. Self-medication and non-doctor prescription practices in Pokhara valley, Western Nepal: A questionnaire-based study. *BMC Fam Pract* 2002;3:17.
- World Health Organization. Guidelines for the Regulatory Assessment of Medicinal Products for Use in Self-Medication. Geneva: WHO; 2000.
- Sharif SI, Ibrahim OH, Mouslli L, Waisi R. Evaluation of self-medication among pharmacy students. *Am J Pharmcol Toxicol* 2012;7:135-40.
- Abasaheed A, Vlcek J, Abuelkhair M, Kubena A. Self-medication with antibiotics by the community of Abu Dhabi Emirate, United Arab Emirates. *J Infect Dev Ctries* 2009;3:491-7.
- Sarhroodi S, Arzi A, Swalha AF, Ashtranezhad A. Antibiotic self-medication among southern Iranian university students. *Int J Pharmcol* 2010;6:48-52.
- World Self-Medication Industry: Responsible self-care and self-medication. A world wide review of consumer surveys. Available from: <http://www.wsmi.org/pdfwsmibro3.pdf>. [Last accessed on 2013 May 18].
- Aljinović-Vucić V, Trkulja V, Lacković Z. Content of home pharmacies and self-medication practices in households of pharmacy and medical students in Zagreb, Croatia: Findings in 2001 with a reference to 1977. *Croat Med J* 2005;46:74-80.
- Almasdy D, Sharrif A. Self-medication practice with nonprescription medication among university students: A review of the literature. *Arch Pharmcol Pract* 2011;2:95-100.
- 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.
- Lau GS, Lee KK, Luk CT. Self-medication among university students in Hong Kong. *Asia Pac J Public Health* 1995;8:153-7.
- Verma RK, Mohan L, Pandey M. Evaluation of self medication among professional students in North India: Proper statutory drug control must be implemented. *Asian J Pharm Clin Res* 2010;3:60-4.
- Martins AP, Miranda Ada C, Mendes Z, Soares MA, Ferreira P, Nogueira A. Self-medication in a Portuguese urban population: A prevalence study. *Pharmacoepidemiol Drug Saf* 2002;11:409-14.
- Sawalha AF. A descriptive study of self-medication practices among Palestinian medical and nonmedical university students. *Res Social Adm Pharm* 2008;4:164-72.
- Zafar SN, Syed R, Waqar S, Zubairi AJ, Waqar T, Shaikh M, *et al.* Self-medication amongst university students of Karachi: Prevalence, knowledge and attitudes. *J Pak Med Assoc* 2008;58:214-7.
- 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.
- Mumtaz Y, Jahangeer A, Mujtaba T, Zafar S, Adnan S. Self medication among university students of Karachi. *J Liaquat Uni Med Health Sci* 2011;10:102-5.
- Alano GM, Galafassi LM, Galato D, Trauthman SC. Responsible self-medication: Review of the process of pharmaceutical attendance. *Braz J Pharm Sci* 2009;45:626-33.
- James H, Handu SS, Al Khaja KA, Otoom S, Sequeira RP. Evaluation of the knowledge, attitude and practice of self-medication among first-year medical students. *Med Princ Pract* 2006;15:270-5.
- Ali SE, Ibrahim MI, Palaian S. Medication storage and self medication behavior amongst female students in Malaysia. *Pharm Pract* 2010;8:226-32.
- Lucas R, Lunet N, Carvalho R, Langa J, Muanantatha M, Nkunda LP, *et al.* Patterns in the use of medicines by university students in Maputo, Mozambique. *Cad Saude Publica* 2007;23:2845-52.
- Corrêa da Silva MG, Soares MC, Muccillo-Baisch AL. Self-medication in university students from the city of Rio Grande, Brazil. *BMC Public Health* 2012;12:339-45.
- Gutema GB, Gadisa DA, Kidanemariam ZA, Berhe DF, Berhe AG, Hadera MG, *et al.* Self-medication practices among health sciences students: The case of Mekelle University. *J Appl Pharm Sci* 2011;1:183-9.

26. Sharif SI, Sharif RS. Antibiotics use with and without prescription in healthcare students. *Am J Pharm Sci* 2013;1:96-9.
27. Al-Azzam SI, Al-Husein BA, Alzoubi F, Masadeh MM, Al-Horani MA. Self-medication with antibiotics in Jordanian population. *Int J Occup Med Environ Health* 2007;20:373-80.
28. Richman PB, Garra G, Eskin B, Nashed AH, Cody R. Oral antibiotic use without consulting a physician: A survey of ED patients. *Am J Emerg Med* 2001;19:57-60.
29. Ghosh S, Vikas V, Gupta A, Chaudhary R. Evaluation of the practice of self-medication among college students in west Uttar Pradesh. *Int J Pharm Prof Res* 2010;1:14-8.
30. Sontakke SD, Bajait CS, Pimpalkhute SA, Jaiswal KM, Jaiswal SR. Comparative study of evaluation of self-medication practices in first and third year medical students. *Int J Biol Med Res* 2011;2:561-4.

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