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Original Research Article

Self-medication among Alexandria University students and effect of an educational intervention on their self-medication knowledge, attitudes and practices

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ABSTRACT

Background: Self-medication (SM) among university students is a growing prevalent public health concern worldwide. It is highly prevalent in developing countries. SM leads to serious consequences such as drug misuse/abuse and adverse drug reactions. The study aims to determine the prevalence of SM among university students in Alexandria, Egypt and to assess the effect of an educational intervention on their SM knowledge, attitudes and self-reported practices (KAP).
Methods: The study was conducted among 400 students using a cross sectional approach followed by one group pre/post-test intervention approach. Data were collected using an interviewing questionnaire. A health education program was designed and implemented among students then KAP were reassessed using the same questionnaire.
Results: The prevalence of SM was estimated to be 79.5% among Alexandria University students. About one quarter (24.5%) of students had poor level of knowledge about SM and 47.5% had positive attitude towards SM. Logistic regression analysis revealed that father's occupation as clerical, family member working as healthcare professional, medication sharing practice, and total SM knowledge score were the significant independent factors that affected SM. There were significant differences between pre and post intervention KAP scores.
Conclusions: The prevalence of SM is high among university students. There is a significant effect of the intervention program on KAP about SM.

Keywords: Self-medication, University students, Knowledge, Attitudes, Practices, Educational intervention

INTRODUCTION

Self-medication (SM) is the use of a product without medical prescription or consultation in order to prevent or treat a disease or a symptom or to promote health. SM may result in serious consequences such as drug misuse/abuse and adverse drug reactions.[1] SM is influenced by age, gender, educational level, and socioeconomic status. Young age and university students were more likely to practice SM.[2,3]

University students are more vulnerable to the prevailing self-care culture, and hence are more independently responsible for their medication use.[4-6] SM is a crucial common problem among university students. Worldwide, the prevalence of SM among university students is high.[1,3,5,7] As well, abuse and misuse of self-medicated drugs was found to be prevalent among university students.[8,9]

In developed countries, the prevalence of SM was 91.7% in Australia (2016) and 90% in Poland (2015).[10,11] In developing countries, reported prevalence of SM among university students was 88% in Croatia (2005), 79.9% in Serbia (2014), 84% in Nepal (2015), and 66% in Pakistan (2017) and 50.2% in Iran (2016).[12-16] Within Africa, the prevalence of SM among university students was also high and ranged between 43.2% in Ethiopia (2011) and 81.8% in Nigeria (2018).[17,18] In Arab countries, the practice of SM is alarming, the prevalence was 98% in Palestine (2008) and 97.8% in Kuwait (2014).[3,19]

The WHO advocates specialized education programs for under-graduate college students who are at stage of learning and their knowledge and attitudes are amenable to modification. This is a good starting point to introduce concepts such as rational use of medicines.[20] Despite the importance of the problem of SM among university students, only two Egyptian studies investigated that problem, one in Mansoura University and the other in Ain Shams University.[21] Moreover, in Egypt, after reviewing existing literature, it has been found that existing educational interventions aiming at improving drug use among university students are scarce.

The present work can be considered the first step in providing baseline quantitative data of patterns of SM among university students in Alexandria and a starting point for wider scale educational intervention in Egypt.

The aim of the study is to estimate the prevalence of SM among students, and design, implement, and assess the effect of an educational program on KAP of students concerning SM.

METHODS

Study design and setting

A descriptive cross-sectional study was conducted among students from medical and non-medical faculties of Alexandria University, Alexandria, Egypt, followed by intervention study (one group pre/post-test design) during the period February to September 2018.

Inclusion and exclusion criteria

Medical and non-medical university students enrolled in first and final study grades who accepted to participate in the study were included.

Ethical considerations

The Ethics Committee of the High Institute of Public Health reviewed and approved the study. The researchers complied with the International Guidelines for Research Ethics. Verbal consent was obtained from participants after explanation of purpose and benefits of the study. Anonymity and confidentiality were guaranteed and maintained.

Sample size determination

For the cross-sectional study, the sample size was calculated using Epi info 7, software. Based on a prevalence of SM of 62.9% and the number of Alexandria University students of about 300,000, the minimum required sample size at 95% confidence level was calculated to be 362 university students and was rounded to 400.[7] For the intervention study, a subsample was calculated using sample size calculator, sample size for pre-post study (paired T-test), based on an effect of 0.2, 5% alpha error, 0.80 power and a standard deviation of the change in the outcome of 1. The subsample amounted to 93 and was rounded to 100 university students.

Type of sample and method of selection

For the cross-sectional study, from the list of non-medical faculties, one faculty was randomly selected, which was the Faculty of Arts. As regards the medical faculties, Faculty of Medicine was selected. The total sample (400) was proportionally allocated according to the number of students in each faculty; 350 students from Faculty of Arts and 50 students from Faculty of Medicine. The sample of students in each faculty was proportionally allocated according to their study grades and they were consecutively recruited until reaching the required sample size. For the intervention study, the subsample (100) was selected from the original sample. Half of subsample (50) recruited from Faculty of Arts using random sampling technique while the other half (50) was from Faculty of Medicine. The students were proportionally allocated according to their study grades.

Data collection tools and methods

A pre-designed structured interviewing questionnaire was designed and comprised 4 sections to collect data from the students.

The first section included questions regarding personal data, such as age, sex, study grade, mother's and father's education and occupation, having a family member working as healthcare professional or studying medical or paramedical sciences, access to healthcare services and health-related questions such as current health status (healthy or suffer from current acute conditions and/or chronic diseases).

The second section of the questionnaire consisted of questions on knowledge about SM and sources of advice on SM. Students were asked to register their level of correctness with each statement under 6 domains of knowledge about SM. The domains included knowledge about advantages and disadvantages of SM, knowledge about drugs in general, knowledge about drug-drug and drug-food interactions, knowledge about side effects of drugs, knowledge about contraindications of drugs, and knowledge about precautions in taking drugs.

The third section of the questionnaire was designed to assess the attitude of students towards SM. The fourth section of the questionnaire focused on SM practices such as whether students practiced SM in the past 12 months, sharing, storage and disposal practices of self-medicated drugs. Students were asked to register their level of agreement with each statement under six domains of attitudes towards SM which were attitudes towards SM instead of seeking doctor's advice, attitudes towards advice of friends and family to self-medicate, attitudes towards awareness about disease and treatment, attitudes towards SM consultation with pharmacist, attitudes towards following physician's drug prescription and attitudes towards reading the package- leaflet of OTC drugs before SM.

Intervention program: An educational program based on the results of the pre-test was designed and consisted of 4 educational sessions. Four topics were considered over-the-counter (OTC) medications and problems of SM, what you need to know before taking OTC medications, (OTC medication safety basics, and antibiotics and analgesics as common OTC medications. Educational materials were developed by the researchers and prepared after reviewing literature related to SM and OTC medicines and were tailored according to the needs of the students. The different educational methods used included group discussions, lectures and audio-visual materials such as power point presentations, booklet and leaflets. In each faculty, students were divided into 2 groups; one from first and another from last years. Knowledge was assessed immediately and three months following the intervention program while attitude and practices were reassessed three months after intervention using the same data collection tool.

Data analysis

Data were coded, entered, and analyzed using the Statistical Package for Social Sciences (SPSS) version 20 software. Descriptive statistics for qualitative results were expressed as count and percentage and for quantitative variables; arithmetic mean and standard deviation were calculated. For analytical statistics, Chi-square (X^2) test was used for analysis of categorical data. Friedman's Test used to assess the significance difference between knowledge scores of pre, immediately after and after 3 months tests following the intervention program. Wilcoxon signed-rank test used to assess the significance difference between attitude scores pre and 3 months following the intervention program. Mc-Nemar test used to compare frequencies of matched pairs (before/after intervention) of categorical variables (practices) for same group and the categories are dichotomous (yes and no). For all statistical procedures, the 5% level ($p<0.05$) was used as cut off value for statistical significance. Variables associated with SM at a level of significance $p\leq0.05$ were entered into the final model of the multivariate logistic regression analysis to predict the independent associations of these variables with SM. Odds ratios (OR) and their respective 95% confidence intervals were calculated. Acceptable prediction was evidenced by a $p\leq0.05$. Scoring system used to assess knowledge of students; answer of each knowledge question was scored as follows: score "0" for incorrect and don't know answers and score "1" for correct answer. Summation of knowledge answer scores was done and it was equal 24. Then a percent total score was calculated. The total sum of knowledge was graded as good (≥75%), fair (50%-75%) and poor (≤50%), (ii) To assess attitude of students; answer of each attitude question was scored as follows: score "3" for positive attitude, score "2" for neutral attitude, and score "1" for negative attitude. Summation of attitude answer scores was done and it was equal to 54. Then a percent total score was calculated. The total sum of attitude was graded as positive attitude (≥75%), neutral attitude (50%-75%) and negative attitude (<50%).

RESULTS

Characteristics of university students

Table 1 shows the main characteristics of the studied students. The mean age was 20.1±1.9 years. Most of non-medical students were females (84.0%) while females represented only 42% of the medical students and 65% were enrolled in their first study grade (Table 1). Most of students had fathers and mothers with university and post-graduate education and had non-working mothers. As for father's occupation, about 30% of working fathers were engaged in professional work, 18.2% in semi-professional, and 17.0% in clerical work. It is clear that fathers of medical students were engaged in professional and semi-professional occupations than non-medical students who had more fathers engaged in manual and clerical work.

Table 1: Characteristics of studied students, Alexandria University, Egypt.

Characteristics	Medical students (n=50)	Non-medical students (n=350)	Total (n=400)
	N (%)	N (%)	N (%)
Age in years			
17-19	26 (52.0)	199 (56.9)	225 (56.2)
20-22	1 (2.0)	125 (35.7)	126 (31.5)
23-25	23 (46.0)	20 (5.7)	43 (10.8)
26-29	0 (0.0)	6 (1.7)	6 (1.5)
Mean age: 20.1±1.9 years			

Continued.

Characteristics	Medical students (n=50)	Non-medical students (n=350)	Total (n=400)
	N (%)	N (%)	N (%)
Sex			
Females	21 (42.0)	294 (84.0)	315 (78.8)
Males	29 (58.0)	56 (16.0)	85 (21.2)
Study grade			
First	27 (54.0)	233 (66.6)	260 (65.0)
Last	23 (46.0)	117 (33.4)	140 (35.0)
Having family member(s) working as healthcare professionals			
Yes	19 (38.0)	102 (29.1)	121 (30.2)
No	31 (62.0)	248 (70.9)	279 (69.8)
Having family member(s) studying medical and/or paramedical sciences			
Yes	19 (38.0)	68 (19.4)	87 (21.8)
No	31 (62.0)	282 (81.6)	313 (78.2)
Current health status			
Healthy	14 (28.0)	68 (19.4)	89 (20.5)
Having acute condition(s)	32 (64.0)	251 (71.7)	283 (70.8)
Having chronic condition(s)	10 (20.0)	170 (48.6)	180 (45.0)
Mother's education			
Illiterate	1 (2.0)	10 (2.9)	11 (2.8)
Read and write or primary	2 (4.0)	19 (5.4)	21 (5.2)
Preparatory and secondary	15 (30.0)	145 (41.4)	160 (40.0)
University and post-graduate	32 (64.0)	176 (50.3)	208 (52.0)
Father's education			
Illiterate	0 (0.0)	8 (2.3)	8 (2.0)
Read and write or primary	1 (2.0)	37 (10.6)	38 (9.5)
Preparatory and secondary	7 (14.0)	101 (28.9)	108 (27.0)
University and post-graduate	42 (84.0)	204 (58.3)	246 (61.5)
Mother's occupation			
Not working	31 (62.0)	259 (74.0)	290 (72.5)
Working	19 (38.0)	91 (26.0)	110 (27.5)
Father's occupation (n=352)*			
Professional	26 (53.1)	78 (25.7)	104 (29.5)
Worker or manual	3 (6.1)	82 (27.1)	85 (24.1)
Semi-professional	15 (30.6)	49 (16.2)	64 (18.2)
Clerical	1 (2.0)	59 (19.5)	60 (17.0)
Trade	4 (8.2)	35 (11.6)	39 (11.1)

*15 of students' fathers passed away, 23 were retired and 10 were not working.

Table 1 also shows that about 21.8% of students had family member(s) studying medical and/or paramedical sciences and 30.2% had family member(s) working as healthcare professionals. Again, medical students had higher rates of family members studying medical and paramedical sciences and more working as health professionals. About 71% of students reported having acute condition(s) at time of interview, while 45% had chronic conditions like migraine and irritable bowel syndrome and only about 21% were healthy.

Prevalence of self-medication

The prevalence of SM was found to be 79.5% among university students (Figure 1). Prevalence of SM among medical and non-medical students was 80% and 79.4% respectively.

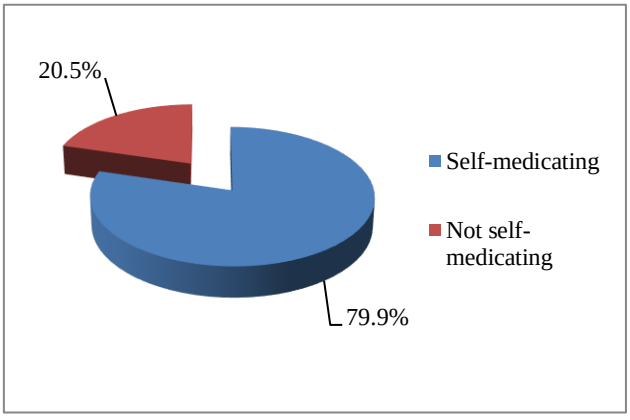

Figure 1: Prevalence of self-medication among studied students, Alexandria University, Egypt.

Knowledge of university students about self-medication

Table 2 presents the scores of knowledge of students about the advantages and disadvantages of SM, knowledge about drug in general, about drug-drug interactions, side effects, contraindications and drug precautions. The table revealed that the mean knowledge score of medical students was significantly higher compared to non-medical students regarding knowledge about drugs in general, drug-drug/drug-food interactions, drug precautions and drug contraindications. It appears from table 2 that 24.5% of students had poor level of knowledge about SM while 55% and 20.5% had fair and good levels, and the total mean knowledge score was 59.1±16.1.

Table 2: Knowledge of studied students about self-medication, Alexandria University, Egypt.

Scores of knowledge	Medical students (n=50)	Non-medical students (n=350)	Total (n=400)	P value
	N (%)	N (%)	N (%)	
Knowledge about advantages and disadvantages of SM				
Poor	6 (12.0)	54 (15.4)	60 (15.0)	0.241
Fair	22 (44.0)	184 (52.6)	206 (51.5)	
Good	22 (44.0)	112 (32.0)	134 (33.5)	
Mean±SD	69.0±21.3	63.9±21.0	64.5±21.1	
Knowledge about drugs in general				
Poor	12 (24.0)	190 (54.3)	202 (50.5)	0.000*
Fair	17 (34.0)	137 (39.1)	154 (38.5)	
Good	21 (42.0)	23 (6.6)	44 (11.0)	
Mean±SD	62.0±25.2	41.0±21.8	43.7±23.2	
Knowledge about drug-drug or drug-food interactions				
Poor	5 (10.0)	59 (16.9)	64 (16.0)	0.011*
Fair	13 (26.0)	146 (41.7)	159 (39.8)	
Good	32 (64.0)	145 (41.4)	177 (44.2)	
Mean±SD	77.0±33.8	62.3±36.2	64.1±36.2	
Knowledge about side effects				
Poor	13 (26.0)	107 (30.6)	120 (30.0)	0.264
Fair	10 (20.0)	96 (27.4)	106 (26.5)	
Good	27 (54.0)	147 (42.0)	174 (43.5)	
Mean±SD	68.0±27.1	62.1±23.7	62.9±24.2	
Knowledge about drug contraindications				
Poor	3 (6.0)	67 (19.1)	70 (17.5)	0.005*
Fair	18 (36.0)	158 (45.1)	176 (44.0)	
Good	29 (58.0)	125 (35.7)	154 (38.5)	
Mean±SD	76.0±30.7	58.3±36.1	60.5±36.0	
Knowledge about drug precautions				
Poor	8 (16.0)	87 (24.9)	95 (23.8)	0.000*
Fair	12 (24.0)	158 (45.1)	170 (42.5)	
Good	30 (60.0)	105 (30.0)	135 (33.8)	
Mean±SD	80.7±27.0	66.5±28.3	68.3±28.5	
General knowledge score				
Poor	6 (12.0)	92 (26.3)	98 (24.5)	0.000*
Fair	20 (40.0)	200 (57.1)	220 (55.0)	
Good	24 (48.0)	58 (16.6)	82 (20.5)	
Mean±SD	69.8±17.5	57.5±15.4	59.1±16.1	

*Significant (p<0.05), SM, Self-medication, SD, standard deviation, Mean calculated as mean percentage score.

Attitude of university students towards self-medication

Table 3 revealed that 47.8% of students had positive attitude towards SM, while 52% had neutral attitude and only 0.2% had negative attitude, with total mean attitude score of 74.5±9.9. There was no significant difference between the mean general attitude score of medical and non-medical students (75.1±10.6 vs. 74.4±9.1, respectively, p=0.601) while there were significant differences between medical and non-medical students in some attitudes particularly awareness of diseases and treatment.

Table 3: Attitudes of studied students towards self-medication, Alexandria University, Egypt.

Scores of attitudes	Medical students (n=50)	Non-medical students (n=350)	Total (n=400)	P value
	N (%)	N (%)	N (%)	
Medical education effect on attitude				
Negative	4 (8.0)			
Neutral	24 (48.0)			
Positive	22 (44.0)			
Mean±SD	70.7±16.4			
Attitudes towards SM instead of seeking doctor's advice				
Negative	2 (4.0)	6 (1.7)	8 (2.0)	
Neutral	17 (34.0)	122 (34.9)	139 (34.8)	
Positive	31 (62.0)	222 (63.4)	253 (63.2)	0.558
Mean±SD	79.7±12.5	81.4±13.9	81.2±13.7	
Attitudes towards advice of friends and family to self-medicate				
Negative	7 (14.0)	63 (18.0)	70 (17.5)	
Neutral	22 (44.0)	170 (48.6)	192 (48.0)	0.001*
Positive	21 (42.0)	117 (33.4)	138 (34.5)	
Mean±SD	71.3±23.1	65.9±22.1	66.6±22.3	
Attitudes towards awareness of disease and treatment				
Negative	6 (12.0)	92 (26.3)	98 (24.5)	
Neutral	20 (40.0)	116 (33.1)	136 (34.0)	0.000*
Positive	24 (48.0)	142 (40.6)	166 (41.5)	
Mean±SD	71.6±16.2	64.2±19.3	65.1±19.0	
Attitudes towards SM consultation with pharmacist				
Negative	2 (4.0)	18 (5.1)	20 (5.0)	
Neutral	27 (54.0)	85 (24.3)	112 (28.0)	0.271
Positive	21 (42.0)	247 (70.6)	268 (67.0)	
Mean±SD	71.6±16.5	79.8±16.6	78.8±16.8	
Attitudes towards following physician's drug prescription				
Negative	1 (2.0)	12 (3.4)	13 (3.2)	
Neutral	21 (42.0)	184 (52.6)	205 (51.3)	0.558
Positive	28 (56.0)	154 (44.0)	182 (45.5)	
Mean±SD	74.5±75.0	70.2±15.2	70.9±15.3	
General attitude score				
Negative	0 (0.0)	1 (0.3)	1 (0.2)	
Neutral	24 (48.0)	184 (52.6)	208 (52.0)	
Positive	26 (52.0)	165 (47.1)	191 (47.8)	0.601
Mean±SD	75.1±10.6	74.4±9.1	74.5±9.9	

*Significant (p<0.05), SM, Self-medication, SD, standard deviation, Mean calculated as mean percentage score.

Table 4: Reported self-medication practices among studied students, Alexandria University, Egypt.

Self-medication practices	Medical students (n=50)	Non-medical students (n=350)	Total (n=400)	P value
	N (%)	N (%)	N (%)	
Medication storage at home pharmacy				
Yes	48 (96.0)	313 (89.4)	361 (90.2)	0.200
No	2 (4.0)	37 (10.6)	39 (9.8)	
Disposal of medication leftovers				
Keep for future use	37 (74.0)	286 (81.7)	323 (80.8)	0.248
Discard	13 (26.0)	64 (18.3)	77 (19.2)	
Medication sharing practice in past 6 months				0.173
Yes	19 (38.0)	169 (48.3)	188 (47.0)	
No	31 (62.0)	181 (51.7)	212 (53.0)	

*Significant (p<0.05).

Self-reported self-medication practices

Table 4 shows 90.2% of students store medications at home pharmacy, 80.8% kept medications for future use without disposal, and 47% shared medications with other people in the past 6 months. There were no differences between medical and non-medical students.

Factors associated with self-medication

Table 5 shows the logistic regression analysis to define the factors affecting SM among students. Four independent variables were significantly affecting SM among students: father's occupation (OR=3.438, 95% CI: 1.274-9.280, p=0.015), family member working as healthcare professional (OR=2.097, 95% CI: 1.121-3.923, p=0.020), medication sharing practice (OR=2.298, 95% CI: 1.332-3.967, p=0.003) and general SM knowledge score (OR= 1.025, 95% CI: 1.009-1.042, p=0.002).

Effect of educational program

Table 6 compares between mean knowledge scores among the intervention sample of students regarding SM pre, immediately and three months post-intervention. The mean knowledge score showed significant increase (p=0.000) in the immediate test and three months post-intervention in all domains of knowledge about SM. General knowledge score showed significant increase from 69.8±17.5 in pretest to 92.6±9.3 in immediate test and 92.5±11.7 in three months post-intervention.

Table 5: Logistic regression analysis of variables affecting SM among studied students, Alexandria University, Egypt.

Independent variables	Coefficient B	P value	OR	95% CI
Father's occupation				
Not working	0.134	0.769	1.144	0.467-2.803
Professional	0.313	0.402	1.367	0.658-2.840
Semi-professional	0.020	0.961	1.020	0.454-2.293
Clerical	1.235	0.015*	3.438	1.274-9.280
Trade (worker or manual (R))	0.318	0.524	1.375	0.516-3.661
Family member working as healthcare professional (yes vs. no)	0.741	0.020*	2.097	1.121-3.923
Current health status (yes vs. no)	0.523	0.346	1.687	0.568-5.010
Existence of acute health conditions (yes vs. no)	0.217	0.641	1.242	0.499-3.091
Medication sharing practice (yes vs. no)	0.832	0.003*	2.298	1.332-3.967
Total knowledge score	0.025	0.002*	1.025	1.009-1.042
Constant	-2.019	0.033		

*Significant (p<0.05).

Table 6: Mean knowledge scores of self-medication among intervention sample of students pre, immediately and three months post intervention, Alexandria University, Egypt.

Scores of knowledge	Pre-intervention	Post-intervention		P value of Friedman test
		Immediate	Three months	
	Mean±SD	Mean±SD	Mean±SD	
Knowledge about advantages and disadvantages of SM	69.0±21.3	96.7±7.5	92.7±14.5	0.000*
Knowledge about drugs in general	62.0±25.2	95.0±10.2	90.7±17.0	0.000*
Knowledge about drug-drug/drug-food interactions	77.0±33.8	78.0±38.0	92.0±19.7	0.000*
Knowledge about side effects	68.0±27.1	92.8±14.4	93.0±15.9	0.000*
Knowledge about drug contraindications	76.0±30.7	96.0±13.7	93.5±20.9	0.000*
Knowledge about drug precautions	80.7±27.1	86.7±24.3	94.7±15.5	0.000*
General knowledge score	69.8±17.5	92.6±9.3	92.5±11.7	0.000*

*Significant (p<0.05).

Table 7 compares mean attitude scores among the intervention sample of university students regarding SM pre and three months post-intervention. The mean attitude score showed significant increase (p=0.000) in the immediate test and three months post-intervention in all domains of attitudes towards SM. General attitude score showed significant increase from 75.1±10.6 in pretest to 81.0±10.9 in three months post-intervention.

Table 7: Mean attitude scores towards self-medication among intervention sample of students pre and three months post intervention, Alexandria University, Egypt.

Scores of attitude	Pre-intervention Mean±SD	Three months post-intervention Mean±SD	Wilcoxon sig. Z-value	P value
Attitudes towards SM instead of seeking doctor's advice	81.9±13.1	84.1±11.8	-2.211	0.027*
Attitudes towards advice of friends and family to self-medicate	68.0±22.8	76.8±21.6	-3.805	0.000*
Attitudes towards awareness of disease and treatment	69.3±17.2	79.1±17.7	-4.307	0.000*
Attitudes towards SM consultation with pharmacist	77.6±16.3	82.3±17.5	-2.525	0.012*
Attitudes towards following physician's drug prescription	73.6±15.0	80.7±14.5	-3.911	0.000*
General attitude score	75.1±10.6	81.0± 10.9	-4.921	0.000*

*****Significant (p<0.05).

Table 8: Self-medication practices among intervention sample of students pre and three months post intervention, Alexandria University, Egypt.

	Pre-intervention N (%)	Post-intervention N (%)	P value of Mc-Nemar test
General SM practice			
Yes	95 (95.0)	50 (50.0)	0.000*
No	5 (5.0)	50 (50.0)	
Medication storage practice			
Yes	92 (92.0)	64 (64.0)	0.000*
No	8 (8.0)	36 (36.0)	
Medication sharing practice			
Yes	38 (38.0)	11 (11.0)	0.000*
No	62(62.0)	89(89.0)	

*Significant (p<0.05).

Table 8 compares SM practices among the intervention sample of university students pre and three months post-intervention. There was a significant decrease in proportions of students who practiced SM, who stored medications at home and who shared medications (p=0.000).

DISCUSSION

The overall prevalence of SM reported in our study (79.9%) was comparable to other studies in Serbia (79.9%), and in Nigeria (81.8%).[13,18] Lower prevalence rates were reported in Egyptian studies in Ain Shams University (55%), and in Mansoura University (62.9%), also studies in Iran, Saudi Arabia and Ethiopia reported lower prevalence rates of SM (50.2%, 50.9% and 43.2%, respectively).[7,16,17,21,22] Higher prevalence was reported in in Palestine (98%), Kuwait (97.8%) and Poland (90%).[3,12,19] Our findings could be explained by the fact that university students are more vulnerable to the prevailing self-care culture, hence self-care orientation and overconfidence in medication knowledge often act as driving force for SM.[3,5] Also, university students usually seek quick relief of illness. Another reason could be due to the easy access and fast purchasing of most medications from community pharmacies than visiting their doctors first.

It is noteworthy that in the current study, both medical and non-medical students were included to capture a comprehensive picture of this practice. However, the study showed no significant differences in the prevalence of SM among medical and non-medical students (80% vs. 79.4%), which were in accordance with studies from other countries. In Saudi Arabia, the prevalence of SM among medical and non-medical students did not differ significantly (49.4 vs. 55.3), similarly in Slovenia, it was found no significant difference between medical and non-medical students regarding the practice of SM (92.8% vs. 91.9%).[22,23] These results are in contrast to the study conducted in Palestine that showed significant difference with less common use of SM among medical students.[3] A possible reason for the non-significant difference in the prevalence of SM among medical and non-medical students, is that nonmedical students could also consider themselves as knowledgeable about drugs as medical students, or both medical and nonmedical students do not care much about the possible risks of practicing SM.[23]

Knowledge and attitude of university students regarding SM have been assessed in many countries.[11,14,16,21,22] Our findings revealed that more than half (55%) of students had fair level of knowledge about SM and 52% had neutral attitude towards SM. The total mean knowledge score in current study is 59.1±16.1 which is lower compared to total knowledge scores in similar studies conducted in USA and Nepal (73.45 and 74.54, respectively).[24,25] Also, the total mean attitude score in current study is 74.5±9.9 which is higher than studies conducted in USA and Nepal (62.75 and 67.19, respectively).[24,25] This confirms that Alexandrian students have inadequate knowledge about SM and are more prone towards SM, which explains the high prevalence of SM practice among them.

Previous studies denoted controversial results about the effect of determinants such as sex, age, family income, level of education, self-care orientation, and previous experience with same symptom on SM among university students.[3,13,23,26] The present study didn't show statistically significant differences among sexes regarding SM, similarly in studies conducted among students in Iran, Palestine, and Slovenia.[3,16,23] Unlike, a study in Serbia which reported that female students self-medicated more than male respondents.[13] The present study showed that students who had family member working as healthcare professional were two times more likely to practice SM compared to those who hadn't (OR=2.097, 95% CI: 1.121-3.923), those who practiced medication sharing were two times more likely to practice SM compared to those who didn't and students' total knowledge about SM found to be significantly affecting practice of SM. Other factors were found to be affecting SM among Egyptian students in Mansoura University; being from urban area, being medical student, having good current health condition, being careless about health, and having drugs stored at home pharmacy.[7] In Brazil, age, male sex, employment, having a partner, and having children were significantly affecting SM among university students.[26] A study in Croatia, reported that existence of a home pharmacy was significantly associated with SM among university students.[12]

The interventional part of the current study highlights the importance of tailored educational intervention targeting university students as an effective strategy to promote their KAP about SM. Results revealed significant improvements in all areas of interventional group of students' knowledge about SM in terms of advantages and disadvantages of SM, drugs in general, drug-drug/drug-food interactions, side effects, drug contraindications and drug precautions. Similarly, an interventional study in India reported that students' knowledge regarding SM in terms of OTC drugs, adverse drug reactions, drug's expiry date, package leaflets, importance of drug's correct dose and duration of use and awareness of drug interactions significantly improved after educational intervention.[27]

Results of the present study denoted significant improvements in all aspects of students' attitudes about SM in terms of attitudes towards SM instead of seeking doctor's advice, advice of friends and family to self-medicate, awareness of disease and treatment, SM consultation with pharmacist and attitudes towards following physician's drug prescription. Also, our results revealed significant improvements in students' practice of SM. Ninety five percent of students reported practicing SM reduced to 50% after educational intervention. These findings were in accordance with study in India in which prevalence of SM was reduced from 93.89% to 78.63% after intervention.[27] However, a study in Spain reported that prevalence of SM among students didn't decrease after educational intervention.[28] It is worth mentioning that medication sharing practice among students decreased from 38% to 11% after intervention, which is in accordance with the study in Spain.[28]

CONCLUSION

Based on results of the study it can be concluded that there is high prevalence of SM among university students as well as lack of proper knowledge and attitude regarding the risks of SM. After educational intervention, there was a significant improvement in the knowledge and attitude leading to decrease in the practice of SM. A tailored educational intervention is of benefit to improve students' KAP about SM. It is recommended to design future multifaceted interventions targeting specific groups of adolescents such as university and school students as to promote responsible SM, and replenish the knowledge and attitude gaps in an effort to reduce irresponsible SM.

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