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Self-medication Practices among University Students in Jordan

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ABSTRACT

Introduction: Self-medication has become an important issue among university students. There is a trend in prevalence of self-medication. This study was aimed to 1) assess the prevalence of self-medication, 2) identify the patterns and attitudes towards self-medication practices, and 3) examine socio-demographic characteristics factors correlate of self-medication among university students in Jordan. **Methods:** A descriptive-correlational design and a stratification random sampling method were used. A self-administered questionnaire was used, which consists of socio-demographic characteristics, information about the patterns of self-medication, and attitudes towards self-medication practices. **Results:** The prevalence of self-medication was 98.4%. Painkillers (paracetamol and non-steroidal anti-inflammatory), antibiotics, and herbals were the most commonly used medicines. Pain (e.g., a headache, toothache, muscle, joint, and abdomen) was the most common symptoms of practicing self-medication. Previous experience, emergency situation, and minor diseases were the main reasons for self-medication use. Pharmacists, family, and physicians were the major sources of drug information for self-medication. Students had high positive attitudes towards self-medication and had awareness of adverse effects of medicines. There was a relationship between gender, health status, and self-medication. **Conclusions:** The results of the study could help to develop strategies and strong policies to promote the logical use of medicine among university students. The university should develop education and prevention measures and implement a self-medication program based on students' attitudes towards self-medication. Drug regulatory and health authorities should enforce restrict application of rules regarding selling and purchasing of self-medication, and design messages targeting to raise awareness regarding the hazards of self-medication.

Keywords: Attitudes, Prevalence, Practices, Self-medication, University students

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INTRODUCTION

Self–medication is a modern style of self-care, which is becoming widely practiced in the developing countries (1, 2) as well as the developed countries (3). It is defined as "the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug by a physician for chronic or recurrent diseases or symptoms (4). Self-medication is also defined as attaining and taking medications without health care providers' supervision of indications, dose, and duration of treatment (5). It is called "non-prescription" or "over the counter" (OTC) and it is accessible without a physician's prescription by pharmacies (6). In some countries, they are also available in supermarkets and other outlets (6). In the developing countries, both modern and traditional medicines are commonly practiced for self-medication (7, 8).

Self-medication includes several forms such as the individual's decision or the individual's care giver's decision without any medical consultation regarding which medication should be used for relief and treatment of self-recognized illnesses or symptoms, sharing medication with other family members and social group, and using the remainder medication from previous prescriptions or disrespecting the medical prescription either by prolonging or interrupting the dosage and duration of treatment (9).

There is an increase in self-medication use especially among the youth including university students, which could be related to many factors such as socio-demographic, lifestyle, accessibility and availability of medication, increased knowledge and awareness to manage diseases, law, society and advertisement, high level of education and professional status (6, 10, 11). Previous studies showed that the most common reasons for self-medication were a previous experience (6, 9, 12), minor health problems, accessibility and availability of medicines, reducing the time spent for managing diseases, and medical costs (6, 12). Furthermore, the use of drugs from informal sectors such as open markets

encourage the practice of self-medication (7).

Self-medication is the first selection in treating minor illnesses, which is considered as non-threatening to the people and continuing for short period (11). Previous studies reported that the most common minor illnesses managed by using self-medication involve a headache (6, 9), cough, common cold (6, 9, 10), fever (9, 10), pain, stomach-ache, problems in bowel elimination, and skin problems (10).

Self-medication has many advantages, it is useful in situations where access to health care facilities is limited. It could offer the benefit of providing quick and effective relief that does not require medical interference, it also relieves pressure on medical health care delivery systems and allow management of serious problems, and alleviates costs for treatment (11, 13, 14). Despite these benefits, it could lead to potential risks such as inappropriate and incorrect use of medicines, inaccurate self-diagnosis, delay of the proper diagnosis and providing the effective management, delay in seeking medical advice when needed, severe medication side effects, toxicity, dangerous drug interactions, potential death (6, 11), drug dependency, hypersensitivity, resistance withdrawal symptoms, and other health problems (15). It could also lead to drug misuse and abuse (13).

Nowadays self-medication is a self-decision, the clients take the more self-responsibility for managing health and obtaining health information from many sources to make the proper choice in health concerns. They can obtain health information from many sources such as pharmacists, families and relatives, friends, and the internet. Pharmacists are considered as members of the healthcare team and play a significant role in assisting clients and advising them in choosing the appropriate self-medication and treatment (10).

Jordan is also experiencing this common practice of self-medication in which people become increasingly familiar with drugs and their brand names. A previous study reported that the prevalence of this practice was 42.5% (16). There is a wider public accessibility of medications in non-pharmacy stores. Moreover, Jordanian clients may buy any medication including antibiotics without having a valid prescription, except controlled narcotics and major tranquilizers that need medical prescription (17). This practice is popular regardless of the Jordanian Drug and Pharmacy Law that considers dispensing antimicrobial drugs without a prescription is a crime and violation of this law is undergoing a financial punishment (14).

There are a few data about self-medication practices among university students in Jordan. However, there is no research available examining why students prefer and select self-medication, what they experience during the treatment period, or how they are affected at the end of the course of treatment. This study will provide an accurate and appropriate assessment of self-medication practices among university students and provide a comprehensive picture of the behaviours and circumstances in which they occur. Identification of this phenomenon is essential for healthcare professionals and policymakers to evaluate the nature of this behaviour and implement awareness and medical education campaigns for the students themselves, physicians, pharmacists, nurses and the public regarding these practices. There are many studies regarding self-medication practices in Jordan, but these studies were not directed to university students and did not assess the predictors for self-medication. Therefore, the purposes of this study were to: 1) assess the prevalence of self-medication, 2) identify the patterns and attitudes towards self-medication practices, and 3) examine socio-demographic characteristics factors that correlate of self-medication among university students in Jordan.

MATERIALS AND METHODS

Design, Setting, and Sampling
A descriptive correlational design was used to determine patterns and attitudes towards self-medication practices. The population in the study were all students enrolled in the Al-Zaytoonah University of Jordan. The total number of students reached about (8000) students studying in seven colleges. A power analysis was conducted to determine the appropriate sample size for this study using the G*Power computer program. The sample size was computed for an alpha of 0.05, a power of 0.95, and a relatively small effect size of 0.1, and a sample of 1077 participants would be needed. To compensate for expected incomplete questionnaires or drop out, 1600 students were invited to participate. A stratification random sampling method was used, whereas, the university was divided into different colleges, then students were selected proportionally according to their colleges. Eligibility criteria included a) university student status, b) ability to read and write Arabic, c) absence of any condition or disability that would make it difficult to communicate, and d) had given full informed consent. While the excluded criteria involved students who had difficulty in communication and reported a serious psychological problem before participation.

Instruments
A self-administered questionnaire was developed by the researchers based on the literature review was used. It consists of three parts: the first part contains socio-demographic characteristics including age, gender, educational level, faculty, grade point average (GPA), and family income/month. The second part consists of twelve questions providing information about the patterns of self-medication practices. The third part consists of 22 positive and negative items to explore attitudes towards self-medication practices and responses. Each item was

rated on a five-point scale ranging from "1= strongly disagree" to "5= strongly agree" for positive items and reversed for negative items (1, 2, 4, 5, 6, 8, and 10).

The content validity and domain representatives of the instrument being developed were established by three Jordanian experts in public health and nursing education. The questionnaire was translated into Arabic and subjected to a process of forwarding and backward translation. The accuracy and meaning of the translated versions both forward and backward were evaluated and necessary recommended amendments were discussed before being finalized. Then, it was pretested on 60 university students and modifications were made as necessary. The internal consistency for the section to determine attitude towards self-medication practices was assessed using Cronbach's α test and was 0.84.

Ethical Considerations

The ethical principles were reviewed and approved by the Deanship of Research and Graduate Studies at the Al-Zaytoonah University of Jordan. Before the initiation of data collection, the study's purposes, benefits, and risks were discussed with the students, and they assured that participation was voluntary. After full explanation and disclosure of this study, eligible participants were asked to sign a written informed consent. Moreover, the anonymity and confidentiality were assured to all participants.

Data Analysis

The Statistical Package for Social Sciences (SPSS) software package, version 23, was used for data analysis. Descriptive statistics [mean, standard deviation, frequencies, and percentage] were used to describe the study sample and students' patterns of self-medication practices and attitudes. Consequently, the correlation test (Point-biserial), Phi-coefficient, Chi-square, Fisher exact test, and Cramer's V were used to examine the correlations between socio-demographic characteristics and self-medication use. Probability values were considered significant at p-values < 0.05.

This study had some limitations. The questionnaire was self-reported which could have led to underreporting of self-medication practices. The descriptive correlational design was considered a limitation, thus a longitudinal design is recommended in the future.

RESULTS

Sample Characteristics

A random sample of the university students [N=1600] participated in the current study. Thirty-five students had not completed the questionnaire, indicating 98% response rate (1565). The sample age ranged from 17-45 years, with the mean age was 21.55 years (SD=2.54). More than half of the sample were males (N=881). Regarding the students' educational level, more than

one-third of them (35.3%) were in the fourth year and above, 28.2% in the third year, 20.9% in the second year, and only 15.7% in the first year. More than 30% of the students had a family monthly income of more than 1000 Jordanian Dinar (JOD) [1JOD= 1.4 U.S Dollar]. A total of 31.9% of the students had a GPA ranged from 68 < 76 (good grades). When students were asked about their health status in general, the highest percentage of them reported a very good health status (43.0%), while 2.9% reported a poor health status. Only 7.5% of the students reported that they have chronic diseases and 69.0% of these diseases were related to respiratory problems (Table I).

Table I: Demographic characteristics of the study population (N=1565)

Characteristics	Frequency	Percent (%)
Age (Years)		
Actual Range= 17.55-45		
M (SD)= 21.55 (2.54)		
Gender		
Male	881	56.3
Female	684	43.7
Educational level		
1st year	245	15.6
2nd year	327	20.9
3rd year	441	28.2
4th year and above	552	35.3
College		
Literature	290	18.5
Economic	282	18.0
Science	270	17.2
Engineer	264	16.9
Pharmacy	244	15.6
Nursing	109	7.0
Law	106	6.8
Income/Month		
< 500 JOD	231	14.8
500 <750 JOD	307	19.6
750 <1000 JOD	503	32.1
>1000 JOD	524	33.5
Grade point average (GPA)		
84-100 (excellent)	268	17.2
76 <84 (very good)	465	29.7
68< 76 (good)	500	31.9
60 <68 (medium)	279	17.8
< 60 (weak)	53	3.4
Health status		
Excellent	584	37.3
Very good	674	43.1
Good	227	14.5
Fair	46	2.9
Poor	34	2.2
Presence of chronic disease		
Yes	118	7.5
No	1447	92.5
Type of chronic disease		
Respiratory diseases	69	58.5
Heart diseases	14	11.9
Diabetes mellitus	6	5.0
Renal diseases	6	5.0
Hypertension	4	3.4
Neurological diseases	3	2.6
Others	16	13.6

J.D: Jordanian Dinar; M: Mean; SD: Standard Deviation

Prevalence, Patterns, and Attitudes towards Self-Medication Practices

The findings showed that the prevalence of self-medication among university students was 98.4%. The findings related to the patterns of self-medication practices among students who used self-medication. The findings also indicated that they used different types of self-medication in the past six months, with the majority of them (56.3%) used painkillers such as paracetamol and non-steroidal anti-inflammatory drugs like panda, aspirin, tramadol, ibuprofen, and voltaren, followed by antibiotics (43.7%), and 22.9% used herbals, respectively. The most common conditions and symptoms for using self-medication were the pain (e.g., a headache, toothache, muscle, joint, and abdominal pain) (68.1%), cough, cold, flu (42.8%), and maintaining health (34.6%). The main reasons for self-medication reported by students were previous experience with medications (46.1%), an emergency situation (37.8%), and minor diseases (33.2%). When students were asked about the ways of obtaining self-medication, the highest percentage of them reported mentioning the medicine to the pharmacist (36.0%).

Results revealed that pharmacists, family, and physicians were considered the main sources of drug information and advice for self-medication (42.9%, 42.7%, and 40.1%, respectively), while 7.9% of students have bought and used self-medication based on an advice from relatives. Concerning the number of medicines used in the past month, more than half (58.6%) of students reported one -two medicines. About 97.4% of students reported that they did not suffer any side effects from self-medication, 50.4% reported sharing medication with family members, relatives, and friends, and 53.7% reported reading the leaflet of medication (Table II).

Around 54.2% of all respondents reported that they had a home pharmacy. Regarding the types of medications available at their homes, 45.6% of the respondents reported that they didn't own any medications at their homes, however, 28% reported they had analgesics, 8.7% reported analgesics and antibiotics, 7.1% reported all types of medications, 7.2% reported antibiotics, 1.9% reported analgesics and antipyretics, 1.2% reported they had antipyretics, 0.3% reported they had antibiotics and 4.9% reported others.

With respect to the attitudes questionnaire, respondents were given a list of statements asserting the attitudes towards self-medication. For the negative statements, the students were more likely to disagree with the negative statements against self-medication, and the highest mean was for the following statements " There are no risks of taking many medications for the same medical problem " (M= 3.30 [1.23 SD]) and "I do not want to bother the doctor with any mild health problems that may occur to me" (M=3.03 [1.27 SD]). Concerning

Table II: Patterns of self-medication among university students use self-medication (N=1540)

Characteristics	Frequency	Percent (%)
Commonly used medicines *		
Painkiller (Paracetamol & Non-Steroidal Anti-Inflammatory)	1245	56.3
Antibiotics	566	43.7
Antihistamines	214	13.7
Antipyretics	211	13.5
Vitamins and Minerals	207	13.2
Sedatives	132	8.4
Laxatives	76	4.9
Weight reduction	59	3.8
Medicine for chronic disease	44	2.8
Herbals	358	22.9
Conditions & Symptoms for using self-medication*		
Pain (headache, toothache, muscle, joint and abdominal pain)	1065	68.1
Cough, cold, flu	670	42.8
Maintaining health	541	34.6
Fatigue	224	14.3
Gastrointestinal problems	143	9.1
Fever	140	8.9
Insomnia	112	7.2
Dysmenorrhea	106	6.8
Minimizing stress	80	5.1
Various injuries	75	4.8
Improving academic performance	79	5.0
Reasons for using self-medications*		
Previous experience	722	46.1
Emergency situation	592	37.8
Minor diseases	519	33.2
Seeking quick relief	275	17.6
Availability of medicines without prescription	250	16.0
High medical cost	216	13.8
Avoidance of waiting long time at clinic	193	12.3
Ways of obtaining self-medication		
Mentioning the medicine to the pharmacist	554	36.0
Providing the medicine by family, relative, friends	419	27.2
Telling the symptoms to the health care provider	394	25.6
Giving the old prescription to the pharmacist	173	11.2
Source of drug information for self-medication *		
Pharmacist	660	42.9
Family	658	42.7
Physician	627	40.7
Friend	157	10.2
Relative	122	7.9
Number of medicines used in the past month		
None	293	19.0
One-two	902	58.6
Three-four	248	16.1
Five and more	97	6.3
Number of side effects of medication in the past month		
None	1500	97.4
1-2 times	40	2.6
Sharing medication with family, relatives and friends		
Yes	788	50.4
No	626	40.6
Reading the leaflet of medication		
Yes	827	53.7
No	313	46.3

* Response more than one

positive statements, the students were more likely to agree with the positive statements, with the highest mean was for the following statements "Even when using self-medication, I have to be careful" (M= 4.31 [0.71 SD]), and "A person should take medication only when necessary" (M= 4.27 [0.93 SD]) (Table III).

The Relationship between socio-demographic factors and self-medication use

A point- biserial correlation test was performed to assess

Table III: Attitudes towards self-medication (N=1565)

Item	M	SD
1-Self-medication is readily available, which makes people use it.	1.80	0.89
2- It is very important to have medicines to relieve minor health problems or cure for a disease.	1.89	0.88
3- A person should take medication only when necessary.	4.27	0.93
4- Self-medication can be used to maintain health.	2.44	1.08
5- There are no risks of taking many medications for the same medical problem.	3.30	1.23
6- If drugs are sold to people, I am sure they are safe.	2.87	1.27
7- If I have a problem, I'd rather avoid taking any medication.	3.88	0.87
8- I do not want to bother the doctor with any mild health problems that may occur to me.	3.03	1.27
9- Advertisements help me find out what types of drugs or brands of drugs I use.	4.02	074
10- I read instructions or instructions carefully before taking any medication for the first time.	4.21	0.76
11- Use of self-medication causes adverse effects on the human body.	3.92	0.77
12- Even when using self-medication, I have to be careful.	4.31	0.71
13- For some health problems, self-medication is as effective as the one I get from a doctor.	2.49	1.11
14- Reading the label on the medicine package is one of the ways to decide which medicine to be used.	3.68	1.09
15- The belief in the safety of self-medication leads me to use it frequently.	2.67	1.22
16- There is abuse of medicines at present.	4.08	0.92
17- Self-medication use has become a problem among people especially university students.	3.78	1.00
18- Continual use of the same medicine may not be effective when I need it.	3.93	0.97
19- If I am unsure of a health problem, I always seek advice from a doctor, pharmacist or nurse.	4.07	0.95
20- I trust health care professionals (such as a doctor, nurse, and pharmacist) as a consultant for self-medication information.	4.04	0.99
21- It is essential to get more health education about self-medication.	4.10	0.96
22- There is a need to open a course on self-medication at the university.	3.98	1.14

M: Mean; SD: Standard Deviation

the relationship between age and self-medication use. The results showed no significant correlation was found between age and self-medication use (r p.b=0.00; p = 0.98).

Phi-coefficient and chi-square tests were performed to determine the relationship between gender and self-medication use. The findings showed that there was a statistically significant relationship between gender and self-medication use (rφ= _ 0.1; p < 0.001) ($\chi^2_{[1]}$ = 13.16; p < 0.001), which reveals that male gender correlated significantly with the higher use of self-medication.

Furthermore, Phi-coefficient and chi-square tests were used to determine the relationship between the presence of chronic diseases and self-medication use. The results indicated no statistically significant correlation was found between the presence of chronic diseases and self-medication use (rφ = 0.03; p = 0.15) ($\chi^2_{[1]}$ = 2.07; p = 0.15).

Chi-square test was performed but Fisher exact test was reported since some of the cells in the contingency table have less than five participants. Fisher exact test indicated that there was no significant correlation between the educational level ($\chi^2_{[3]}$ =3.16; p = 0.36), family income ($\chi^2_{[3]}$ = 2.31; p = 0.51), GPA ($\chi^2_{[3]}$ = 8.05; p = 0.09) and self-medication use. However, results showed that there was a statistically significant association between health status ($\chi^2_{[3]}$ = 16.55; p < 0.01), which displays that the students who had excellent health status had lower self-medication use than those with poor health status. Furthermore, Cramer's V test was applied and the results showed that there was no significant correlation between the college and the self-medication use (φc = 0.08; p = 0.13).

DISCUSSION

The prevalence of self-medication among university students in this study was 98.4%. This result is consistent with previous studies conducted among university students which showed that 98% of Palestinian students (18) consumed self-medication. Previous literature have demonstrated a wide variation in the prevalence of self-medication among university students (5, 6, 8, 9, 18-25). This variation could be related to cultural factors, socio-demographic characteristics, and methodologies used in these studies. Furthermore, this high percentage could be related to the availability of medical information, availability of the medicines in markets, and purchasing medicines without medical prescription (17, 23).

This study found that the most common medicines used in self-medication were painkillers such as paracetamol and non-steroidal anti-inflammatory drugs followed by antibiotics. This result has been seen in several previous studies (6-8, 18). Painkillers are considered the first line medicines especially paracetamol for any kind of pain management (6). A total of 43.7% of self-medicated students in this study used antibiotics. This result is lower than a previous national study (55.9%) (26), similar to Romanian study (44.0%) (27), and higher than the results in two studies conducted in Ethiopia (17.2%, 4.8%) (6, 8) and Palestine (19.9%) 18). This result may be related to easily purchasing of antibiotics from drug stores without a prescription, misusing of antibiotics in treating minor diseases such as cold, flu, and mild fever (6, 17), and repeating the use of the same antibiotics in treating similar symptoms in the future 26). The study demonstrated that more than one-fifth of the students used herbals. This result indicates the fact that students still depend on the traditional therapy such as herbals for self-medication that is culturally accepted in the Jordanian society.

The major symptoms reported with self-medication use in this study were the pain (e.g. a headache, toothache, muscle, joint and abdominal pain), followed by a cough, cold, and flu. These results are consistent with previous research literature, which indicated that a headache, cough, and common colds were the most common

symptoms among university students who practiced self-medication (6, 8, 9, 18, 20, 24, 25).

The results of the current study revealed that the main reasons for self-medication reported by students were a previous experience, an emergency situation, and minor diseases. However, previous studies found that prior experience and mildness of the disease were the major reasons among university students (6, 10). Other studies identified mildness of an illness and a previous experience as the main reasons among Egyptian and Palestinian university students (18, 25). In particular, this study has shown an emergency situation as one of the reasons for self-medication use, which is consistent with a previous study (10). While, mildness of the diseases was often documented in many studies and different literature as the major cause for self-medication use among university students (6-8, 24). A previous Jordanian study revealed that the most common reasons for self-medication among Jordanian were too minor complains to consult the doctor, avoiding doctor's consultation fees, and long waiting time for treatment (16).

In relation to Jordanian students regarding ways of obtaining medicines, the current study revealed that students obtained medicines mainly from a pharmacy by mentioning the medicine to the pharmacist, which is consistent with previous research findings (9, 25) indicating that university students obtained medicines mostly from a pharmacy. However, some studies have shown that the majority of students obtained medicines from drug retail outlets (6, 8). This result confirms that there is inappropriate regulation over the availability and selling of medicines could lead to improper use of these medicines.

Regarding the source of drug information for self-medication, the results of the current study revealed that Jordanian university students reported pharmacists, family, and physicians. However, the previous studies indicated self-decisions, family, and friends were the main sources of information for self-medication use (6, 18). Moreover, Hassali et al (28) reported that friends and pharmacists were the most common sources, but Helal and Abou-ElWafa (25) indicated family as the major source. Gutema et al (6) showed physicians and pharmacists as the main sources of drug information. On the contrary, Abay and Amelo (10) revealed reading a related material was the main source of information. The results of this study enforced the role of the pharmacists and physicians as health care providers in delivering worthy information on self-medication. The pharmacists should play a significant role in identifying the best treatment and management for the disease-related symptoms.

In this study, almost all of the students did not suffer from any side-effects in the past month. This result could motivate students on continuing practice of self-medication and encourage their friends, families, and relatives on self-medication. This study indicated that more than half of self-medicated students shared medicines with their families, relatives, and friends. The previous literature documented that the reasons for medicine sharing include excessive medical cost or high doctor fees (29, 30), urgent conditions or emergency cases, and convenience (31). Furthermore, it could lead to negative consequences such as drug allergies, consuming improper medicines, and many other side effects (32).

This study showed that more than half of self-medicated university students read the leaflet of the medicines, which is consistent with a previous study (25). This may be considered as a good indicator for increasing awareness among university students regarding indications, side effects, and precautions of self-medication. In our study, 54.2% of the students had a home pharmacy, which is lower than the result among Egyptian university students that indicated 77.5% of students had a home pharmacy and stored medicine (25). Availability of a home pharmacy and stored medicines enhance accessibility and easily utilization of drugs, which is considered as an associated factor for self-medication (33).

The university students in this study reported higher score of positive attitudes towards self-medication and "being more careful when using self-medication" had the highest score in all attitudes statements, which is consistent with a previous Egyptian study (25). These findings might be explained in many reasons including a general principle affecting attitudes is that students tend to justify their behaviour of self-medication with perceived benefits or harm. Moreover, the students knew about the harmful effects of self-medication but knowledge is not enough because as noted above, mainly all of the students practiced self-medication. The students' perception of the hazards of self-medication is not enough to change their self-medication behaviour, so changing attitudes is more important in terms of chances for using the medicines wisely.

The results of the current study demonstrated a positive relationship between gender, health status, and self-medication use, which imply that male university students with poor health status are at higher risk for developing self-medication than female university students with excellent health status. These results are consistent with previous studies reported male gender (34) and having a poor health status were the most factors of self-medication use (35). A possible justification for these results is that male self-medicated students with poor health status believe that self-medication is effective and it enhances disease prevention and treatment and health maintenance.

CONCLUSION

These results could be generalized to all university students in Jordan, the results may be representative of the views of students in urban and rural areas in Amman and outside of Amman. These study results are significant because the self-medication prevalence among university students was high. Painkillers (paracetamol and non-steroidal anti- inflammatory drugs), antibiotics, and herbals were the commonly used medicines. Pain (e.g., a headache, toothache, muscle, joint, and abdomen) was the most common symptom of practicing self-medication. A previous experience, an emergency situation, and minor diseases were the main reasons for self-medication use. Mentioning the medicine to the pharmacist was the main way of obtaining a medicine. Pharmacists, family, and physicians were the major sources of drug information for self-medication. The students had high positive attitudes towards self-medication and had awareness of adverse effects of medicines. Gender and health status correlated with self-medication use.

The current study findings could help to develop strategies that could promote the logical use of medicines among university students and their families. The university through education and prevention measures should develop and implement an active self-medication program based on students' attitudes towards self-medication including lectures, workshops or an elective course. Drug regulatory and health authorities should enforce restrict application of Jordanian Drug and Pharmacy law and rules that consider dispensing antimicrobial drugs without a prescription is a crime and violation of this law is undergoing a financial punishment, regarding selling and purchasing of prescribed, non-prescribed medicines and self-medication, and design messages targeting to raise awareness regarding the hazards of self-medication. Moreover, health care providers (e.g., pharmacists, physicians, and nurses) should consider their role in facing this issue through providing counseling to clients about indications, instructions for use, and side effects of medications, in addition to alter medication use to affirm that medicines are safe and efficient. Also, they can develop health education programs and campaigns to improve knowledge and wise use of self-medication in the community and particularly among university students. They could support and implement available policies and instructions about purchasing self-medication and improper use of medicines. Additionally, the measures and legislation towards limiting the selling of medicines should be activated and employed in order to limit this problem. Future research is needed to determine the relationship between other socio-demographic factors and self-medication.

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