

Evaluation of Self-Medication Practice among Pharmacy Students in Jordan

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ABSTRACT

Problem: To assess the practice of self-medication, among pharmacy students.

Experimental approach: A cross-sectional study was conducted for a period of three months. A pre-validated questionnaire was distributed to pharmacy students at the University of Jordan. A total of 256 students participated in the study.

Major Findings: The prevalence of self-medication among pharmacy students was 86.7%. The prevalence of students who obtained their medication from pharmacies was 56.6%, and about 30.5% reported using drugs without a medical referral 5 to 6 times last year. The majority of students (83.2%) read the leaflet about the drug before using it. The two major reasons for self-medication were to save time and perceived non-seriousness of illness. The presence of severe pain and worsening symptoms were the main reasons to seek medical help. Cough and cold preparations, antibiotics and vitamins were the drugs most frequently used in self-medication.

Conclusion: Self-medication is highly prevalent among pharmacy students at the University of Jordan. Students were aware of some facts about self-medication, however more effort to educate pharmacy students to promote responsible self-medication use is needed. Potential interventions, including strict policies from health authorities, should be applied to prohibit the provision of medicines without a prescription.

Keywords: Self-medication, Pharmacy students, OTC drugs.

1. INTRODUCTION

The use of medications without any medical consultation may result in adverse drug reactions and drug toxicity.¹ Self-medication, as it is called, is not only restricted to the use of over-the-counter (OTC) drugs, but it may also involve the use of prescription drugs.^{2,3} This practice is associated with an increased possibility of antibiotic resistance, polypharmacy, drug interactions and drug abuse.^{3,4}

Self-medication is oftentimes the first option chosen for treating illnesses,^{5,6} which is a global trend with a

prevalence of 68% in European countries⁷ and 92% in developing countries.⁸

James *et al.* reported several reasons for self-medication, including the lack of time, the high cost of medical consultation, the unavailability of healthcare personnel, and previous experience with the illness and its drug management.⁹ There is abundant public and professional concern about the irrational use of drugs,¹⁰ especially in countries where prescription drugs are freely dispensed with no strict regulations.¹¹

Self-medication involves the use of drugs without medical advice. Although drugs are used to cure diseases, their inappropriate use may result in adverse effects that

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are more serious than the original disease itself.¹² In this context, health authorities need to ensure that self-medication is done in a responsible manner, ensuring that safe OTC drugs are available, and that the consumer is given adequate information about when to consult a doctor and how to use drugs properly.^{4,13}

A high level of education and professional status have been mentioned as predictive factors for self-medication.¹⁴ Self-medication has been frequently reported among university students.^{1,11,12,15,16} Several studies have shown that students' medical knowledge influences their self-medication patterns.^{9,16,17} Pharmacy students may differ from the general population because they are exposed to knowledge about diseases and drugs.

The present study was undertaken to evaluate the practice of self-medication among undergraduate pharmacy students at the University of Jordan. The objective of this study was to determine which groups of drugs were most frequently used by pharmacy students as OTC drugs and to assess the practice of self-medication among pharmacy students.

Methodology

A cross-sectional questionnaire-based study was conducted for a period of three months (November 2016 to January 2017) at the University of Jordan (UJ) School of Pharmacy. The UJ was chosen as a recruitment site because it is the only university in Amman, Jordan, that has both pharmacy and PharmD programs.

The target population was fourth, fifth and sixth year UJ pharmacy and PharmD students. A convenience sampling technique was utilized in the present study to recruit students, who were approached by the authors at the end of their lectures. Authors explained the nature and purpose of the study to students. Students were then included only after providing written informed consent. The study subjects were informed that participation was completely voluntary, and the information collected would be anonymous. Students who refused to sign the consent

form or take part in the study were excluded. A total of 256 students participated in the survey. Assuming a confidence level of 90%, a margin of error of 5%, a recruitment rate of 50% and a maximal sample size of 1000 students, the minimum required sample size, was 214, as calculated by the Rao soft sample size calculator (<http://www.raosoft.com/samplesize.html>).

The study was approved by the Research and Ethics Committee at the University of Jordan College of Pharmacy. A printed English version of a pre-validated questionnaire, consisting of three parts as modified from questionnaires used in other studies,^{9,11,16} was developed. The questionnaire was first piloted on a sample of 20 students to ensure clarity of the questions. The use of OTC or prescription drugs without medical consultation was considered self-medication.

The questionnaire included questions covering demographic data and year of study, and questions focusing on self-medication. The latter included questions about drugs students commonly used for self-medication, their reasons for or against OTC drug use, students' sources of drugs, and their views on the safety of self-medication. As some of the questions allowed choosing from multiple options, the sum of percentages was not always 100%. Many of these questions are outlined in Tables 1, 2, and 3.

Data were analyzed using SPSS software version 23. Descriptive data were expressed as frequencies and percentages. Chi-square and Fisher exact tests were used to test significant differences between categorical variables. All *p*-values were two-sided, and any *p*-value of less than 0.05 was considered statistically significant.

Results

Characteristics of participants

Of the 286 students who were approached for this study, a total of 256 students were enrolled. The mean age of the students was 22.6 years. Females accounted for 90.2% of participants. Characteristics of participating students are described in Table 1.

Table 1. Characteristics of participants (N = 256)

Age (mean ± SD)	21.56 ± 1.4
	N (%)
Gender	
<input type="checkbox"/> Female	231 (90.2)
<input type="checkbox"/> Male	25 (9.8)
Specialty	
<input type="checkbox"/> Pharmacy	55 (21.5)
<input type="checkbox"/> PharmD	201 (78.5)
Level of study	
<input type="checkbox"/> Fourth year	156 (61.0)
<input type="checkbox"/> Fifth year	60 (23.4)
<input type="checkbox"/> Sixth year	40 (15.6)

Practice and prevalence of self-medication

Self-medication was reported by 86.7% (N = 222) of participating students. Self-medication practice was not significantly different between pharmacy or PharmD students (83.6% vs. 87.6%, $p = 0.447$), different academic levels ($p = 0.655$), or gender (84% vs. 87%, $p = 0.673$). Table 2 outlines the responses from participants about their self-medication practices. As shown in the table, about one-third of the students have practiced self-medication at least once in the previous year. Before using the drug, 83.2% read the leaflet, and about three-quarters of respondents reporting being aware of the adverse effects. Students reported obtaining medicines from different sources, including pharmacies (56.6%), home stock (31.3%), herbal stores (7.0%), and other sources such as friends (3.9%).

Table 2. Self-medication practice by pharmacy students in the past year (N = 256)

	N (%)
Have you ever treated yourself with medication without a referral to a doctor?	
Yes	222 (86.7)
Do you think self-medication is harmful?	
Yes	139 (54.3)
How many times did you practice self-medication and uses OTC drugs in the past year?	
<input type="checkbox"/> 1-2	72 (28.1)
<input type="checkbox"/> 3-4	69 (27.0)
<input type="checkbox"/> 5-6	78 (30.5)
<input type="checkbox"/> 7-8	17 (6.6)
<input type="checkbox"/> 9-10	5 (2.0)
<input type="checkbox"/> >10	15 (5.9)
When you treat yourself, are you aware of rational drug use?	
Yes	228 (89.1)
Do you think that the medication you use to treat yourself gives symptomatic relief, but does not treat the cause of the ailment?	
Yes	146 (57.0)
For how long was the treatment used?	
<input type="checkbox"/> One week	225 (87.9)
<input type="checkbox"/> Two weeks	24 (9.4)
<input type="checkbox"/> One month	2 (0.8)
<input type="checkbox"/> Longer than one month	5 (2.0)
Do you know the potential adverse drug reactions of the drug by which you self-medicated?	
<input type="checkbox"/> Yes	190 (74.2)
<input type="checkbox"/> No	66 (25.8)
When you treat yourself with a medication, do you read the leaflet of the medication before using it?	
Yes	213 (83.2)

What sources of OTC drugs do you use?		
<input type="checkbox"/>	Pharmacy	145 (56.6)
<input type="checkbox"/>	Home stock	80 (31.3)
<input type="checkbox"/>	Friends	10 (3.9)
<input type="checkbox"/>	Herbal store	18 (7.0)
<input type="checkbox"/>	Others	3 (1.2)

Indications and drug classes for self-medication

Figures 1 (a) and (b) summarize the drug classes and major indications reported by students who practiced self-medication. Pain (88.7%), headache (81.6%), and cough and cold (75.4%) were the major indications for which students reported practicing self-medication. Cough and cold preparations (61.3%), antibiotics (45.3%), and vitamins (41.8%) were the most common drug classes.

Analgesics were more commonly used by female students compared to male students (84.1% vs. 62.5%, $p = 0.021$), while antibiotics were more commonly reported by male students (66.7% vs. 42.3%, $p = 0.03$). There were no statistically significant differences in the drug classes used for self-medication between pharmacy or PharmD students.

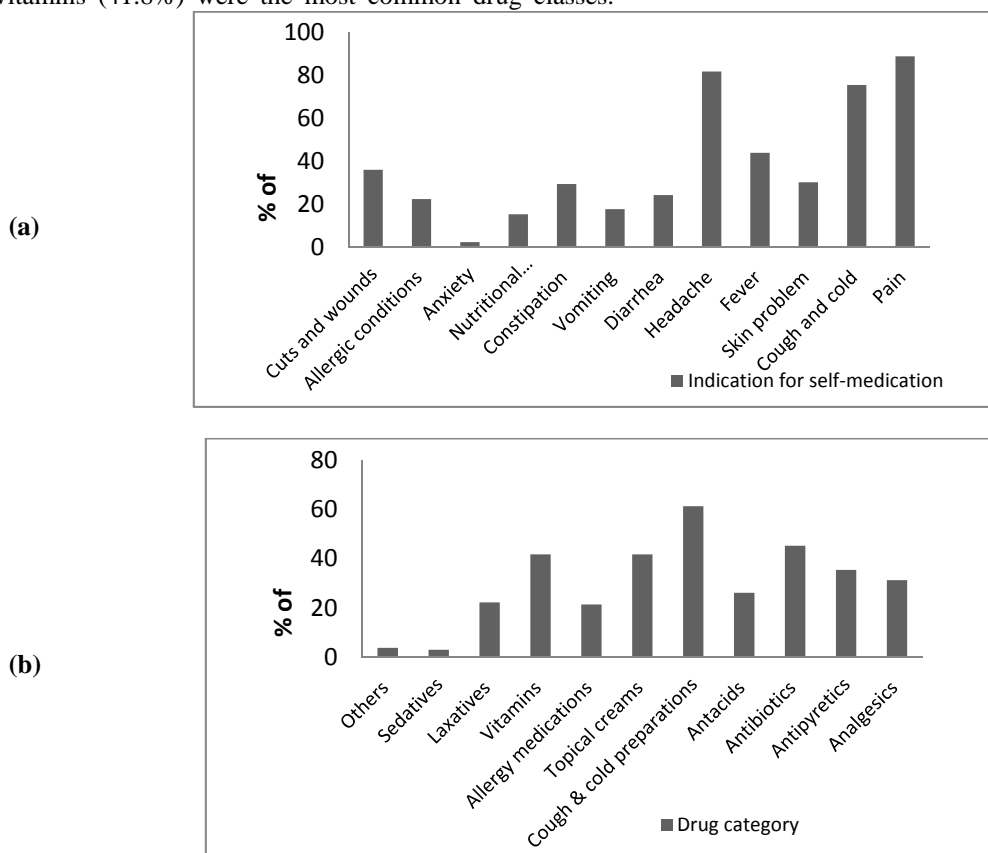


Figure 1: Categories of drugs commonly self-prescribed by pharmacy students and indications for self-medication. Participants were asked to select as many items as applicable. (a) The medical conditions for which participants practiced self-medication. (b) Common drug classes used in self-medication by pharmacy students

Factors affecting the practice of self-medication

As shown in figure 2 (a), the most common reasons for self-medication among participating students were to save time (63.7%), the belief that the disease was not serious (47.7%) and ease of drug availability and convenience (45.7%). There were no statistically significant differences in the reasons for self-medication between males and females, different academic levels or specialty of the students.

The presence of severe pain (66.4%), worsening symptoms (62.1%) and symptoms lasting more than one week (60.2%) were the most common reasons to seek medical help as reported by students.

The risk of using the wrong medications (58.2%), disease misdiagnosis (52.3%) and risk of adverse effects (48.4%) were the most commonly reported reasons that discouraged student from self-medication.

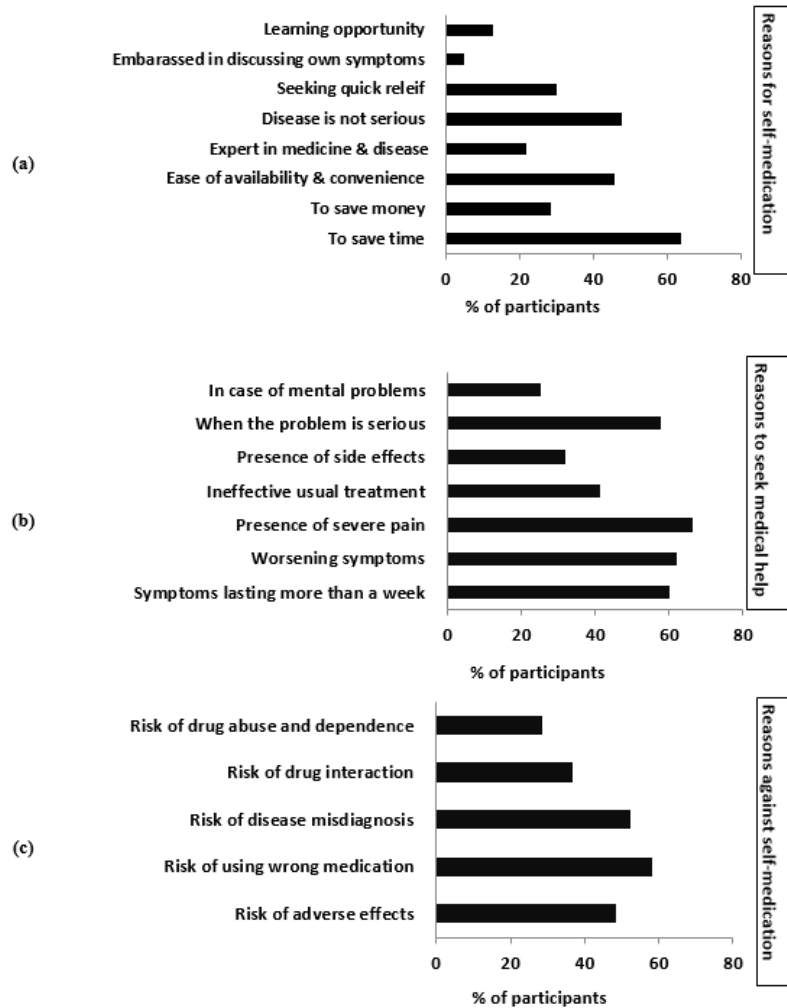


Figure 2: Factors that affect the participants' practice of self-medication. Participants were asked to select as many factors as applicable. . (a) Reasons that encourage self-medication. (b) Reasons that encourage participants to seek medical help. (c) Reasons against self-medication

Students' views on the safety of self-medication

Table 3 depicts students' views about certain aspects related to the risks that may result from practicing self-medication. Only 49.0% answered correctly that "Any drug, including a herbal one, has side effects". A total of 83.3% of students were aware that increasing the drug dose may be dangerous. On the other hand, a lower percentage

of students (56.6%) were aware that decreasing the dose of certain drugs may also be dangerous. Only 14.7% of students were unaware of the fact that using drugs with unknown substances in patients with liver and kidney diseases is very dangerous. Finally, only 33.5% of students were aware that some drugs may be safely used in pregnancy.

Table 3. Students' views on safety of self-medication (N= 251)

Item	*N (%)	
	Approve	Disapprove
Any drug, including an herbal one, has adverse effects	123 (49.0)	128 (51.0)
Simultaneous use of drugs, including herbal ones, may be potentially dangerous	159 (63.3)	92 (36.7)
Increasing the drug dose may be dangerous	209 (83.3)	42 (16.7)
Lowering the drug dose may be dangerous	142 (56.6)	109 (43.4)
In case of adverse effects, a physician's help must be sought	200 (79.7)	51 (20.3)
Using drugs with unknown substances in patients with liver and kidney diseases is very dangerous	214 (85.3)	37 (14.7)
No drug may be used during pregnancy	167 (66.5)	84 (33.5)
Mild medical problems do not need drug treatment	142 (56.6)	109 (43.4)
Self-treatment may mask symptoms and signs of diseases, so that the physician may easily overlook them	177 (70.5)	74 (29.5)

* The number of participating students who approve or disapprove the previous statements.

Discussion

Self-medication reduces treatment burden on health care facilities and saves time for the patient by increasing access to medications. However, it also increases risks such as incorrect diagnosis, polypharmacy and excessive use of medication.¹⁸

Studies on self-medication have reported different prevalence rates in different parts of the world, including those ranging from 26.2% to as high as 98%.^{14,15,19,20}

This cross-sectional study has shown that the prevalence of self-medication among pharmacy students in Jordan was 86.7%, which is higher than that reported for the general population in Jordan in 2008 (42.5%).²¹ Several previous studies have similarly shown a high prevalence of self-medication among pharmacy and medical students in different parts of the world.

^{1,11,16,19,22,23,24} In addition, in this study, about one-third of students had used drugs without medical referral 5 to 6 times per year. These results may be explained by the fact that the majority of participants in the present study were female PharmD students who have been exposed to courses on disease pathophysiology and pharmacology of drugs. Information about medical conditions and available treatments may explain the high tendency toward self-medication practice not only for non-prescription drugs but also for prescription drugs, which is consistent with other studies.

There were several student responses that are considered good practices for self-medication. The majority of students (83.2%) reported reading the leaflet about the drug before using it, and most reported awareness of rational drug use (89.1%) and the potential

adverse reactions of the drugs used in self-medication (74.2%). About half of the participants believed that the medication used OTC provided symptomatic relief, but did not treat the cause of the ailment.

Among medicines which were used as self-medication, cough and cold preparations, antibiotics and vitamins were the drugs most frequently used by pharmacy students. Of those who practiced self-medication, 45.3% took an antibiotic, which was similar to the more than 53% that did the same in an Iranian study.³ In another study in Abu Dhabi, it was found that 56% of respondents reported the use of antibiotics within the last year.² Antibiotics were more reported as self-medication by male students compared to females (66.7% vs. 42.3%, $p = 0.03$). This was similar to another study by Ghaieth et al. (2015).²⁵ The use of antibiotics as self-medication exacerbates the problem of antimicrobial resistance in Jordan,²⁶ which warrants the attention of both academic and health authorities to increase awareness of students on the proper use of antibiotics.

Lower levels of self-medication with antibiotics were reported in Lithuania 39.9%²⁷ and in western Nepal (11%).²⁸

Vitamin usage for self-medication was reported in nearly 41.8% of our sample which was comparable to results reported in Karachi¹². On the other hand, lower levels (3% and 10.2%) were reported in Bahrain and Mozambique, respectively.^{9,29}

In our study, analgesics were more frequently used by female students compared to male students (84.1% vs. 62.5%, $p = 0.021$) which may be explained by the fact that females commonly seek painkillers for menstruation-related pain.¹ The most commonly reported symptoms by students were pain, headache, cough and common cold and fever followed by cuts and wounds and constipation.

A major source of obtaining drugs was from a pharmacy (56.6%); this result is similar to findings by Patel et al. (2013)²³ and Shah et al (2015)¹ who reported pharmacy as a major source of acquiring OTC drugs. This is likely due to free access to medicines and lack of strict rules for obtaining them in developing countries like Jordan.

The two major reasons for self-medication in this study were to save time and the perceived non-seriousness of illness. Perceived low severity of symptoms of illness is also frequently reported in the literature and various studies,^{17,23,30}

The presence of severe pain and worsening symptoms were ranked as the main reasons that encouraged participants to seek medical help, which were reasons similar to those reported by pharmacy students in the United Arab Emirates.¹¹ In our study, the risk of using the wrong medication was the most reported reason against self-medication, which was in agreement with that reported by university students in other countries.^{9,11,31,32}

Interestingly, 83.3% of students were aware that increasing the dose of certain drugs may be dangerous, while a lower percentage of students (56.6%) were aware that decreasing the dose of certain drugs could also be dangerous. Only 49.0% of students agreed with the concept that drugs and herbal preparations have adverse effects. This relatively low percentage might be due to the general public misconception that herbal drugs are safe. Although these responses by pharmacy and pharmD students indicate some awareness about certain aspects of self-medication, there is still a need to focus on unsafe and incorrect patterns of self-medication in relevant courses of pharmacology and pharmacy practice. This would enable students to use self-medication in a safe and responsible manner.

Overall, results from this study bring attention to the attitudes and patterns of self-medication among pharmacy students in Amman. Unsafe patterns of self-medication could lead to the occurrence of adverse drug reactions,^{33,34} and this needs to be addressed in future studies.

Limitations

The study findings are based on a single study center, and the inclusion of more centers and a larger sample size would enable us to better characterize the practice of self-medication among pharmacy students. In addition, recall bias may be another limitation in this study as the utilized questionnaire investigated the practice of self-medication of students over the past year.

Conclusions

This cross-sectional study has found that self-medication is highly prevalent among pharmacy students at the UJ. The assessment of self-medication is important for studying proper drug use. In this study, pharmacy student awareness of some facts about self-medication seems appropriate; however, more effort to promote responsible self-medication are needed. The findings of this research should form the basis for future interventional

plans to educate pharmacy students and make them aware of the potential consequences of self-medication. In addition, strict policies from health authorities should be applied to prohibit the provision of medicines without a valid prescription.

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تقييم ممارسة الدواء الذاتي بين طلاب الصيدلة في الأردن

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ملخص

الأهداف والغايات: تهدف هذه الدراسة الى تقييم ممارسة التطبيب الذاتي والعوامل المؤثرة فيه بين طلاب الصيدلة. **الطرق:** أجريت دراسة على أساس استبانة معدة لهذا الغرض لمدة ثلاثة أشهر. وتم اختبار الاستبانة للتحقق من صحتها بتوزيعها على الطلاب (بكالوريوس صيدلة ودكتور صيدلة) في الجامعة الأردنية. شارك فيها 256 طالبا وطالبة.

النتائج: كان انتشار التطبيب الذاتي بين طلاب الصيدلة في الأردن بلغت نسبة عالية وصلت إلى (86.7%). وأن نصف الطلاب (56.6%) حصلوا على أدويتهم من الصيدليات، وحوالي (30.5%) من الطلاب قد تستخدم الأدوية دون الإحالة الطبية 5-6 مرات في السنة. وكانت الغالبية العظمى من الطلاب (83.2%) تمارس قراءة نشرة الدواء قبل استخدامه. أما توفير الوقت وعدم خطورة المرض فكانا من الأسباب الرئيسية للتطبيب الذاتي في هذه الدراسة في حين كان وجود الألم الشديد وازدياد الأعراض سوءا من الاسباب الرئيسية التي تشجع المشاركين لطلب المساعدة الطبية. ومن بين الأدوية الأكثر شيوعا التي كانت تستخدم للتطبيب الذاتي، أدوية السعال ونزلات البرد، والمضادات الحيوية والفيتامينات.

الخلاصة: التطبيب الذاتي منتشر بشكل كبير بين طلاب الصيدلة في الأردن. وبالرغم من وعي الطلاب في بعض جوانب التطبيب الذاتي إلا أن هناك حاجة إلى مزيد من الجهود لتثقيف طلاب الصيدلة لتعزيز مسؤوليتهم تجاه التطبيب الذاتي. وكذلك فإن التدخلات الموصى بها تشمل سياسات صارمة من السلطات الصحية لمنع توفير الأدوية دون وصفة طبية صالحة.

الكلمات الدالة: التطبيب الذاتي، طلاب الصيدلة، أدوية.