



Original Research

# A descriptive study of self-medication practices among Palestinian medical and nonmedical university students

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## Abstract

**Background:** The implications of self-medication practices are increasingly recognized around the world; however, little has been reported on the extent of self-medication practiced in Palestine.

**Objective:** To determine the reasons, extent, and correlates of self-medication practices among university students in Palestine.

**Methods:** A self-administered questionnaire eliciting self-medication practices was distributed to university students in a cross-sectional design. The 4 variables, sex, type of school, self-care orientation, and medication knowledge, were investigated for possible correlation with self-medication practices. Multiple logistic regression and Chi-square statistics were used in data analysis.

**Results:** Self-medication practices were reported by 98% of the surveyed students ( $n = 1581$ ). Approximately two thirds of the respondents reported a high self-care orientation and one third reported “good” medication knowledge. Multiple logistic regressions indicted that self-care orientation, medication knowledge, and sex were insignificant predictors of self-medication practices, whereas the type of school ( $P = .012$ ) was a significant predictor. A significant relation between the 4 variables and the type of therapeutic class used in self-medication was observed. For example, males were more inclined to use antiallergic medications ( $OR = 1.48$ ) than females. Medical students were more likely to use laxatives/antidiarrheal agents ( $OR = 1.49$ ) than nonmedical students. Respondents with high a self-care orientation were more inclined to use headache relievers ( $OR = 2.22$ ) compared to those with low self-care orientation. The most commonly reported reason for self-medication practices was simplicity of the illness encountered.

**Conclusion:** Self-medication practices were common among the university students studied. Sex, type of school, self-care orientation, and medication knowledge are important personal factors that are associated with the selection of certain types of therapeutic classes used in self-medication.

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**Keywords:** Self-medication practice; Self-care orientation; Medication knowledge; University students; Palestine

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## Introduction

Self-medication is a common practice worldwide.<sup>1–5</sup> In Palestine, self-medication practices are

presumed to be common, given its regulatory climate in this regard.<sup>6</sup> For example, people in Palestine can obtain medications such as antibiotics or sedatives without a prescription. Based

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on this, practices such as the utilization of prescription and/or nonprescription medication without prior medical consultation is considered a part of self-medication's operational definition.<sup>7</sup>

Several personal factors could influence self-medication practices, including sex, income, self-care orientation, and medication knowledge.<sup>5,8,9</sup> Self-care-oriented people are those who undertake activities without professional assistance to promote their own health.<sup>10</sup> Both self-care orientation and medication knowledge are important factors in determining the attitudes toward and the consumption of medications.<sup>11</sup>

There have been several reports addressing the extent of self-medication practices among university students in other countries,<sup>12–16</sup> but none from Palestine. The current study was undertaken (1) to describe self-medication practices among university students, (2) to identify potential factors that are associated with self-medication practices, and (3) to identify reasons for self-medication practices. University students were chosen for this study due to several reasons. They are highly influenced by the media and the Internet which promotes self-medication behavior; some of those students will be future health care providers, so their health seeking behavior might influence their medical practice; and nothing has been previously published regarding self-medication practices among these persons in Palestine. Moreover, this population was more easily accessible and more likely to respond than other populations.

## Methods

### *Study population*

This cross-sectional descriptive study was carried out at An-Najah National University, the largest university in Palestine. Approximately 16,000 students are currently enrolled at 16 different medical and nonmedical faculties (colleges/schools). A prevalidated questionnaire containing open-ended and closed-ended questions was developed at the Poison Control and Drug Information Center (PCDIC) and used for the study. A total of 1600 questionnaires were distributed in November 2006. The questionnaire was distributed to all students attending randomly selected classes at different faculties. Permission to carry out this project was obtained from the University administration and the medical research ethics committee. Students were given the

questionnaire at the beginning of classes and were asked to deliver the completed questionnaire to the PCDIC mailbox located at the college of pharmacy.

### *Study tool: the questionnaire*

The questionnaire consisted of 5 sections. The first section contained questions regarding demographic information such as age, sex, type of school, and place of residence. In addition, participants were asked whether they had access to a health center, a physician, and/or a pharmacy nearby, whether they have health insurance, and if they have ever practiced self-medication in general, and in the past month in particular. Students enrolled in pharmacy, medicine, or nursing colleges were designated as "medical" students, whereas the remaining students were designated as nonmedical students. The second section of the questionnaire consisted of questions related to the therapeutic classes that respondents reported using in self-medication practices. Respondents were presented with a list of therapeutic classes and a brand example for each class from which to choose. The third section of the questionnaire focused on the health conditions that respondents would self-treat. This part was also used to assess respondents' level of self-care orientation. Respondents who indicated that they would self-treat 5 or more conditions of the presented list were considered to have high self-care orientation, whereas those who selected less than 5 cases were considered to have low self-care orientation. The rationale for this cutoff point was based on previously published research<sup>11</sup> where respondents reporting 30% of the listed health conditions were considered to have high self-care orientation.<sup>11</sup> In the fourth section of the questionnaire, respondents were asked to select and state the reason(s) for practicing self-medication. The fourth part also contained questions regarding who recommended the self-treatment for the respondent. The last section was designed to assess respondents' medication knowledge based on Isacson and Bingefors methodology.<sup>11</sup> Respondents were presented with 6 questions that could be answered by "yes," "no," or "I do not know." Medication knowledge was determined by the number of correct answers. One point was given for each correct answer, 1 point was deducted for each wrong answer, and selecting "I do not know" did not affect the grade. Respondents with a total of 1 and above were considered to have good medication knowledge, whereas those with a total of 0 and below were considered to have

poor medication knowledge. Respondents who answered less than 4 questions were excluded.

### Statistical analysis

The data were coded, entered, and analyzed using the statistical package for social sciences program (SPSS) version 13. Descriptive results were expressed as frequency, percentage, and mean  $\pm$  SD. Linear multiple logistic regression was used to identify predictors of self-medication practices among the 4 tested variables (sex, type of school, degree of self-care orientation, and level of medication knowledge). Chi-square statistical analysis was used to test for significant associations between each variable and the different therapeutic classes reported.

## Results

### Characteristics of the study population

A total of 1581 out of 1600 questionnaires were completed and returned, giving a response rate of 98.8%. The mean age of respondents was  $19.9 \pm 1.7$  years, with a range of 18–24 years. Most (63.4%) respondents were females (Table 1) studying at nonmedical colleges. It is noteworthy that 58% of the students registered at An-Najah

University are females, and 12 out of the 16 faculties are nonmedical. Most respondents reported living in either villages (50.3%) or cities (46.5%). Fifty-eight percent of the respondents reported having health insurance, and 84.9% reported living within an area where a clinic or a pharmacy is nearby. One third of the respondents reported high self-care orientation, and about two thirds were deemed to have good medication knowledge. Chi-square statistical analysis indicated that the level of self-care orientation was insignificantly associated with sex or the type of school. Medication knowledge was significantly associated with type of school ( $P < .01$ ), but not sex.

Approximately 98% of the respondents reported that they do practice self-medication. Of those, 37.7% reported having done so at least once in the past month. Self-medication was practiced by 96.6% of the medical students, 98.6% of the non-medical students, 97.6% of males, and 98.2% of females. Additionally, self-medication was practiced by 98.8% of respondents with high self-care orientation, and 97.5% of respondents with low self-care orientation. Finally, self-medication was practiced by 98.1% of respondents who have good medication knowledge, and by 97.7% or those with low medication knowledge (Table 1).

### Therapeutic classes used

The total number of medications reported by the respondents was 4073, resulting in an average of  $2.63 \pm 1.38$  medications per respondent, with a range of 1–11 medications. The percentage use of certain therapeutic classes was also investigated. The percentage use was calculated by dividing the number of respondents reported using a particular class over the total number of respondents who practiced self-medication ( $n = 1546$ ). Headache relievers were the most common class used in self-medication, followed by decongestants (45.3%), and antibiotics (19.9%).

Many respondents were taking several different medication classes simultaneously. Approximately 23% of respondents reported using 1 class of medications, 29.3% reported using 2 different classes, 22.4% reported using 3 different classes, and 12.7% reported using 4 different classes of medications. For example, it was noted that respondents who were self-medicating with antiallergic medications were using simultaneously an average of  $4.28 \pm 1.38$  medications; a mean of  $2.79 \pm 1.37$  simultaneous medications was reported among those taking headache relievers. Table 2 contains detailed information

Table 1  
Characteristics of the study population

Variable	Number (%) (n = 1581)	Practiced self-medication (%)
Sex		
Male	577 (36.5)	564 (97.6)
Female	1001 (63.3)	984 (98.2)
Type of school		
Medical	468 (29.7)	453 (96.6)
Nonmedical	1112 (73.3)	1096 (98.6)
Availability of medical services near residence		
Yes	1092 (69.1)	1069 (97.9)
No	489 (30.1)	477 (97.6)
Have health insurance		
Yes	922 (58.3)	904 (98.0)
No	651 (41.2)	637 (97.8)
Self-care orientation		
High	529 (33.5)	523 (98.8)
Low	1052 (66.5)	1026 (97.5)
Medication knowledge		
Good	1016 (64.3)	997 (98.1)
Poor	562 (35.5)	549 (97.7)

Table 2  
Therapeutic classes reported in self-medication practices

Therapeutic classes used	Number (%)	Average number of medications taken simultaneously $\pm$ SD
Headache relievers (paracetamol)	1370 (86.6)	2.79 $\pm$ 1.37
Decongestants	715 (45.3)	3.47 $\pm$ 1.30
Herbal remedies	512 (32.4)	3.26 $\pm$ 1.42
Antibiotics <sup>a</sup>	314 (19.9)	3.89 $\pm$ 1.38
Laxatives/antidiarrheal agents	295 (18.7)	4.09 $\pm$ 1.34
Topical treatments	284 (18)	3.89 $\pm$ 1.38
Back pain relievers (NSAIDs)	221 (14)	4.04 $\pm$ 1.47
Ulcer medications	159 (10.1)	4.27 $\pm$ 1.4
Antiallergic medication	105 (6.6)	4.28 $\pm$ 1.38
Sedatives <sup>a</sup>	69 (4.4)	3.72 $\pm$ 1.53
Do not remember	52 (3.3)	2.29 $\pm$ 1.65
Others	22 (1.4)	3.82 $\pm$ 1.89

<sup>a</sup> Prescription-only medications. Other classes maybe classified as prescription-only or over-the-counter medications, depending on their active ingredient(s) and dosage strength.

about the percentage use of the different therapeutic classes and the average number of simultaneous medications used. Respondents reported 18 different health conditions for which self-medication were practiced. The most commonly reported health condition for which respondents practiced self-medication was headache. The least commonly reported health conditions for which respondents practiced self-medication were for losing weight (6.1%) and respiratory problems (8.7%). There was a positive correlation between the number of health medications reported to be consumed and the number of health conditions that respondents would treat by self-medication ( $r = 0.78$ ).

#### Correlates of self-medication practices

Sex, type of school, level of self-care orientation, and level of medication knowledge were the 4 main variables tested for potential correlation with self-medication practices. Multiple logistic regression indicated that only the type of school was a significant predictor ( $P = .012$ ) for self-medication practices, with nonmedical students reporting a greater likelihood of self-medication (OR = 1.42). On the other hand, sex, level of self-care orientation, and medication knowledge were insignificant predictors ( $P > .05$ ) of self-medication practices. Chi-square

statistical analysis indicated that the 4 investigated variables had a significant influence on self-medication practices within specific therapeutic classes (Table 3). For example, students with a higher self-care orientation were more inclined to use headache relievers (OR = 2.22) and decongestants (OR = 2.11). Males were more inclined to use antihistamine and sedatives (OR = 1.48 and 1.33, respectively) than were females. Medical students were more inclined to use antibiotics and medications for diarrhea/constipation compared to nonmedical students (OR = 1.35 and 1.49, respectively). Finally, nonmedical students tended to use more sedatives compared to medical students (OR = 1.44). Students with good medication knowledge were more inclined to use medications for diarrhea/constipation and herbs than those with poor medication knowledge (OR = 1.14 and 1.09, respectively).

#### Reasons for self-medication practices

When respondents were asked why they practice self-medication, the majority (58%) indicated that they did so because their illnesses were simple, or because they have experience from previous episodes (29%). A lesser percentage of respondents reported that they practice self-medication because of lack of trust in medical services, or to save money. When asked about who recommended self-medication to them, the majority reported that they did so based on self-decision (47%), or based on advice from family and friends (41%). The rest practiced self-medication based on the media or herbalist advice.

#### Discussion

This study showed that self-medication practices are very common among university students in Palestine. Unfortunately, there are no data available regarding self-medication practices among the general public in Palestine, which makes it difficult to compare the extent of self-medication among university students with those in the general public. The net average number of medications consumed in self-medication practices among university students was  $2.63 \pm 1.38$  per respondent. This is relatively higher than that reported elsewhere.<sup>17</sup> A possible reason for this high average consumption is that university students usually seek quick relief of illnesses, and thus they consume multiple remedies in case of ailment. Another possible reason is that students, for economic reasons, may consume several medications of low price instead of obtaining a high-cost

Table 3  
 Analysis of the most commonly reported therapeutic classes, and the factors that affected their utilization

Therapeutic classes that were used	Type of variable	Number of respondents (%)	Chi-square (P value) <sup>a</sup>	OR <sup>b</sup>
Headache relievers (paracetamol)	Males	503 (89.2)	NS	2.22
	Females	869 (88.3)		
	Medical	406 (89.6)	NS	
	Nonmedical	966 (88.1)		
	High self-care orientation	495 (94.6)	<0.01	
	Low self-care orientation	877 (85.5)		
Good medication knowledge	889 (89.2)	NS		
Poor medication knowledge	481 (87.6)			
Back pain relievers (NSAIDs)	Males	73 (12.9)	NS	1.98
	Females	148 (15.0)		
	Medical	68 (15.0)	NS	
	Nonmedical	153 (14.0)		
	High self-care orientation	129 (24.7)	<0.01	
	Low self-care orientation	92 (8.9)		
Good medication knowledge	154 (15.4)	NS		
Poor medication knowledge	67 (12.2)			
Antibiotics	Males	117 (20.7)	NS	1.83
	Females	196 (19.9)		
	Medical	118 (26.0)	<0.01	
	Nonmedical	196 (17.9)		
	High self-care orientation	165 (31.5)	<0.01	
	Low self-care orientation	149 (14.5)		
Good medication knowledge	209 (20.9)	NS		
Poor medication knowledge	104 (18.9)			
Herbs	Males	149 (26.4)	<0.01	1.19
	Females	364 (37.0)		
	Medical	179 (39.5)	<0.01	
	Nonmedical	334 (30.5)		
	High self-care orientation	208 (39.8)	<0.01	
	Low self-care orientation	305 (29.7)		
Good medication knowledge	350 (35.1)	0.05		
Poor medication knowledge	163 (29.7)			
Decongestants	Males	275 (48.8)	NS	2.28
	Females	441 (44.8)		
	Medical	217 (47.9)	NS	
	Nonmedical	499 (45.5)		
	High self-care orientation	346 (66.2)	<0.01	
	Low self-care orientation	370 (36.1)		
Good medication knowledge	472 (47.3)	NS		
Poor medication knowledge	243 (44.3)			

(Continued)

Table 3  
Continued

Therapeutic classes that were used	Type of variable	Number of respondents (%)	Chi-square ( <i>P</i> value) <sup>a</sup>	OR <sup>b</sup>
Laxatives/antidiarrheal agents	Males	90 (16.0)	<0.01	1.12
	Females	206 (20.9)		
	Medical	120 (26.5)	<0.01	1.49
	Nonmedical	176 (16.1)		
	High self-care orientation	173 (33.1)	<0.01	2.11
	Low self-care orientation	123 (12.0)		
Good medication knowledge	211 (21.2)	0.016	1.14	
Poor medication knowledge	85 (15.5)			
Ulcer medication	Males	67 (11.9)	NS	
	Females	92 (9.3)		
	Medical	56 (12.4)	NS	
	Nonmedical	103 (9.4)		
	High self-care orientation	91 (17.4)	<0.01	1.86
	Low self-care orientation	68 (6.6)		
Good medication knowledge	116 (11.6)	NS		
Poor medication knowledge	43 (7.8)			
Antiallergic medications	Males	55 (9.7)	<0.01	1.48
	Females	50 (5.1)		
	Medical	23 (5.1)	0.04	1.12
	Nonmedical	82 (7.5)		
	High self-care orientation	65 (12.4)	<0.01	1.97
	Low self-care orientation	40 (3.9)		
Good medication knowledge	65 (6.5)	NS		
Poor medication knowledge	40 (7.3)			
Topical treatments	Males	98 (17.4)	NS	
	Females	186 (18.9)		
	Medical	90 (19.9)	NS	
	Nonmedical	194 (17.7)		
	High self-care orientation	157 (30.0)	<0.01	1.93
	Low self-care orientation	127 (12.4)		
Good medication knowledge	179 (18.0)	NS		
Poor medication knowledge	105 (19.1)			
Sedatives	Males	33 (5.9)	0.03	1.33
	Females	36 (3.7)		
	Medical	14 (3.1)	0.05	1.44
	Nonmedical	55 (5.0)		
	High self-care orientation	32 (6.1)	0.016	1.41
	Low self-care orientation	37 (3.6)		
Good medication knowledge	37 (3.7)	NS		
Poor medication knowledge	32 (5.8)			

NSAIDS, non steroidal anti-inflammatory agents.

<sup>a</sup> NS, statistically not significant. The percentage for each therapeutic class was calculated as follows: each subgroup was divided based on the total number of that subgroup who reported practicing self-medication.

<sup>b</sup> Odds ratio.

prescription medication. This high average medication consumption among Palestinian university students is worth further study. Moreover, the consumption of medications by the broader Palestinian population should be examined.

It was also noticed that nonmedical students have higher odds of using self-medication. This might be explained by the fact that such students lack medical background, consequently, they might end up using several medications to relief 1 symptom, whereas medical students would self-medicate with the proper medication from the first time. In this study, headache relievers were the most commonly reported therapeutic class consumed through self-medication. Similar results were found by other researchers in other countries.<sup>8,12,16-18</sup> Among headache relievers, paracetamol was the most common. NSAIDs were also commonly reported in self-medication. These results were similar to those obtained in other studies conducted in other countries.<sup>15,17</sup> Potential problems that could be associated with self-medication with headache relievers are nephropathy and hepatotoxicity.<sup>20,21</sup> Use of antibiotics were also commonly reported in self-medication practices. Self-medication with antibiotics could result in several unwanted health consequences to the individual and the health system. The most common health conditions treated by self-medication were headache, sore throat, flu, and menstrual pain. Such health conditions were also reported to be commonly self-treated in other parts of the world.<sup>12,19</sup> The reasons cited for self-medication by respondents in this study were similar to those reported in other studies.<sup>12,15</sup>

Previous studies reported controversial results regarding the influence of factors such as education, sex, age, socioeconomic status, and availability of drugs on self-medication practices.<sup>5,8,9,19</sup> In this study, although sex, level of self-care orientation, and level of medication knowledge were insignificant predictors of self-medication practices, they were significantly influential in the selection of therapeutic class used in self-medication practices. Self-care orientation had a significant influence in the utilization of all reported therapeutic classes. Students with a high self-care orientation always had higher odds of using any therapeutic class than students with a low self-care orientation. This is expected because respondents with high self-care orientation are usually more confident and consequently select any therapeutic class more easily than those with low self-care orientation. Sex had a significant influence in the selection of 4 out of

10 therapeutic classes. The common use of herbs by females is consistent with other studies published elsewhere.<sup>22</sup> Studies in other parts of the world have sometimes revealed conflicting results on the influence of sex on self-medication practices.<sup>15,23</sup>

Medication knowledge was also a significant factor in the selection of 2 therapeutic classes. Students with good medication knowledge preferred to use herbs and laxatives more than those with poor medication knowledge. This might reflect high levels of awareness toward potential adverse effects of other therapeutic classes. Finally, the type of school was also a significant factor in the selection of 5 out of 10 therapeutic classes reported. Medical students have higher odds for using 3 therapeutic classes (antibiotics, herbs, and laxatives/antidiarrheal). On the other hand, nonmedical students had higher odds for using 2 types of therapeutic classes (sedatives and antiallergic medications). It is noteworthy that students at medical schools have higher odds for using antibiotics compared to those in nonmedical schools. This might be due to the academic background of medical students which acquaints them with the various types of antibiotics and their indications. It may also be attributed to the fact that nonmedical students may not be fully aware of the potential side effects of medications. A study by James et al<sup>12</sup> investigating self-medication among students in a neighboring country has found the students who practiced self-medication had poor knowledge of those medications.<sup>12</sup> One other study investigating the use of antibiotics among university students found that students from pharmacy and nursing colleges used less antibiotics compared to nonmedical students; however, the researchers concluded that the use of antibiotic by those students was irrational and that knowledge did not correlate with the behavior.<sup>14</sup>

Pharmacists may have an important role to play in helping people seeking self-medication. People who practice self-medication may not be adequately knowledgeable to judge, for example, the choice or dose of the drug or how long the treatment should continue. Several medical articles have reported that common medications have been associated with adverse health reactions.<sup>24-26</sup> Furthermore, Hughes et al<sup>27</sup> suggested that becoming used to self-medication can cause one to slip toward the self-medication of prescription medications and/or inappropriate drug use. Studies have shown that patients who self-medicate on

prescription medications obtain what they need from leftover medications<sup>28,29</sup> or by obtaining them without prescription.<sup>30,31</sup> In the current Palestinian situation with the open, relatively unregulated pharmaceutical market, people might be encouraged to obtain any medication once they feel that there are no barriers imposed to obtain such medication. This partially explains the current situation. Furthermore, the time saved in the self-medication process might encourage people to obtain prescription medications directly without spending money and time at the clinics.

### Limitations

This study had several limitations. The most important limitation is that the answers reported by the respondents cannot be validated. Some studies have shown that respondents may tend to underestimate their actual use of some medications.<sup>32</sup> However, other studies related to health conditions have shown that respondents' answers can be trusted and can be used in epidemiological studies.<sup>33</sup> Another important limitation in this study is the cutoff point used in the methodology for determining the level of self-care orientation. This cutoff point was adopted from a Swedish study which might not be the same in the Palestinian situation. As previously mentioned, the self-medication practices of Palestinian may well be different from those of the general population of Palestine.

### Conclusion

Self-medication practices were common among university students in Palestine. Factors such as sex, type of school, self-care orientation, and medication knowledge significantly influenced therapeutic classes used. The results suggest a significant role for pharmacists to get more involved in patient education regarding practicing self-medication. The Palestinian National Authority/Ministry of Health may consider publishing an official list of prescription-only medications and of over-the-counter ones. Future research regarding the prevalence of self-medication among other categories is recommended.

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