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Assessment of Self-Medication Practice among University Students in Palestine: Therapeutic and Toxicity Implications

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Abstract: Objective: self-medication is practiced significantly worldwide. No data is available on the current status of self-medication practice in Palestine. The objective of this study is to assess the extent of self-medication practice among a random sample of An-Najah National University students. **Methods**: this was a cross-sectional, anonymous, questionnaire-based survey that included 1581 students of different academic levels enrolled at different faculties at An-Najah National University. A pre-validated questionnaire with several open-ended and closed-ended questions was administered to the students. Data were coded, entered, and analyzed using SPSS version 13. **Results**: sixty three percent of respondents were females enrolled at non-medical schools. The mean age of respondents was 19.9 years. Ninety-eight percent of respondents reported practicing self-medication. There was no statistical difference between respondents who reported practicing self-medication based on gender or type of school (medical vs. non medical). The average number of medications reported by self-medication practitioners was 2.63 ± 1.38 medications per respondent. Analgesics, decongestants, herbal remedies, and antibiotics were the most common classes reported in self-medication. Headache, sore throat, flu, and dysmenorrhea were the most common aliments for which respondents seek self-medication. The majority of respondents practiced self-medication because the ailments they had were simple or because they had previous experience. The majority of respondents had good medication knowledge but did not posses high self-care orientation. Neither medication knowledge, nor self-care orientation was a predicting factor associated with the practice of self-medication. However, in selecting a particular type of medication the type of school, gender, and self-care orientation were influential. **Conclusion**: self-medication is very common among An-Najah students. This practice is common for treating clinical conditions that are either simple or previously experienced. Although, no significant predictors of self-medication did exist among the studied group, levels of self-care orientation and medication knowledge can be of value in analyzing the types of medications employed by self-medication practices.

Key words: self-medication, self-care orientation, Palestine, An-Najah National University, medication knowledge.

النّتائج الطبيّة و السمية للتطبيب الذاتي بين الطلبة الجامعيين في فلسطين

الملخص: الأهداف: إن التطبيب الذاتي شائع في العالم كله .لا يوجد معلومات عن الوضع الحالي لممارسة التطبيب الذاتي في فلسطين.إن هدف هذه الدراسة هو تقييم درجة ممارسة التطبيب الذاتي بين عينة عشوائية من طلبة جامعة النجاح الوطنية. **الطريقة:**هذه دراسة وصفية تعتمد على الاستبانة ، وشملت1581 طالباً من مختلف السنوات الدراسية ومن مختلف كليات الجامعة . تم تجربة الاستبانة و التّأكد من وضوحها قبل استخدامها . تحوي الاستبانة أسئلة متنوعة و تم توزيعها بشكل عشوائي على الطلبة . تم إدخال البيانات و تحليلها بواسطة برنامج إحصائي. **النتائج:** ثلاثٌ وستون بالمئة من المشاركين كانوا من الإناث اللواتي يدرُسنَ في كليّات غير طبيّة ، متوسط عمر المشاركين كان ١٩.٩ سنة. تسعٌ وثمانون بالمئة من المشاركين أشاروا إلى استخدامهم للتطبيب الذاتي . لم تكن هناك فروق إحصائية بين المشاركين اللذين مارسوا التطبيب الذاتي بناءاً على جنسهم أو نوع الكلية التي يدرسوا فيها (طبية أو غير طبية). متوسط عدد الأدوية التي تم استخدامها في التطبيب الذاتي كان ٢.٦٣ ± ١.٣٨ لكل مشترك. المسكنات، مضادّات الاحتقان، الأعشاب الطبية، و المضادّات الحيويّة، كانت أكثر المجموعات الدوائية المستخدمة في التطبيب الذاتي. الصداع، ألم الحلق، الرشح، و آلام الدورة الشهرية كانت أكثر الأسباب الطبية التي استخدم لتطبيب الذاتي لعلاجها. أغلبية المشاركين مارسوا التطبيب الذاتي لأن المرض كان بسيطاً أو لأن لديهم خبرة سابقة به. أغلبية المشاركين يتمتعون بمعرفة جيّدة بالأدوية و لكنهم لا يتمتعون باهتمام عالي بالذات. لم تكن المعرفة بالأدوية أو مستوى الاهتمام بالذات ذا أهميّة لتوقع ممارسة التطبيب الذاتي. لكن في اختيار نوع الدواء كانت العوامل المؤثرة هي الجنس، نوع الكلية، و درجة الاهتمام بالذات. **الاستنتاج:** التطبيب الذاتي شائع جدّاً بين طلبة جامعة النجاح. هذا النوع من الممارسة شائع لمعالجة الأمراض البسيطة أو ما يمتلك الطلبة خبرة سابقة به. رغم عدم وجود عامل لتوقع ممارسة التطبيب الذاتي إلا أن مستوى المعرفة بالأدوية و كذلك مدى الاهتمام بالذات لهما دور في تحليل نوعيةالأدوية المستخدمة.

Introduction

The use of medications without prior medical consultations regarding indication, dosage, and duration of treatment is referred to as self-medication [1]. In most illness episodes, self-medication is the first option [2;3] which makes self-medication a common practice worldwide [4-7].

Responsible self-medication which requires a certain level of knowledge and health orientation had several advantages [1]. Self-medication reduces the load on the medical services, decreases the time spent in waiting to see the physician, and saves cost especially in economically-deprived countries with limited health care resources [8,9]. However, responsible self-medication is not free of risk. Self-medication practices can further increase the burden and out-of-pocket expenses since it may result in adverse health effects that will require medical attention. Published articles have reported that common over-the-counter (OTC) medications have been associated with adverse health reactions [10] or fatalities [11;12]. Moreover, Hughes *et al*. have indicated that self-medication can slip towards self-medication of prescription medications and/or inappropriate drug use such as misdiagnosis, high or low doses and/or treatment duration [13]. Such practices may result in irrational drug use, delayed seeking medical advice, and increased side effects and drug interactions [13]. Several studies investigating self-medication have revealed sub-therapeutic doses, and frequent self-medication with antiobiotics and other prescription-only-medications (POM) [14;15]. Self-medication is influenced by many factors such as education, gender, age, socioeconomic status, and availability of drugs [7;16;17]. Other studies found that such factors were not influential [18].

In Palestine, most people have access to all types of medications which makes self-medication an easy practice. To help improve health care, it is important to have baseline data regarding self-medication so that future interventions can be planned and regulations be implemented. Hence, the objectives of this study were to (1) assess and determine the extent of self-medication among a random sample of students at An-Najah National University, and (2) to identify potential factors that could influence self-medication practices.

Methods

This is a cross-sectional descriptive study carried out at An-Najah National University/ Palestine which is the largest university in Palestine. It is located in Nablus city, home for approximately 200,000 Palestinian. Approximately 16,000 students (8261 males and 7996 females) are currently enrolled at An-Najah National University in 16 different faculties. There are a variety of schools such as the medical schools (human medicine, pharmacy, nursing, and optometry), and the non-medical schools (such as engineering, agriculture, fine arts, and others).

A pre-validated questionnaire containing open-ended and close-ended questions was developed at the Poison Control and Drug Information Center (PCDIC) to be used for the study. A total of 1600 questionnaire were distributed in the month of November 2006. The two-pages questionnaire was distributed randomly to students attending different classes at different schools. Students were given the questionnaire at the beginning of the class and were asked to return it at its end.

The questionnaire contained five sections. The demographic section was the first one and contained information regarding age, gender, type of school, academic level, and place of residence. In addition, participants were asked whether there was a health centre, a physician, or a pharmacy nearby, whether or not they have health insurance, and if they have practiced self-medication in general, and in the past month in particular. Students who are enrolled at pharmacy, medicine, or nursing schools were designated as medical students, whereas all the rest were designated as non-medical students. The second section of the questionnaire consisted of questions related to the types of medications that respondents have utilized in self-medication practices. Respondents were presented with a list of medications to choose from. The list included; headache relievers, back-pain relievers, ulcer medications, medications for diarrhea or constipation, herbal remedies (anise, chamomile, sage, cinnamon, cumin, and others), antibiotics, medications for allergy or congestion, topical treatments, sedatives, and others. The third section of the questionnaire focused on the hypothetical ailments that respondents would self-treat. The list of ailments included bronchospasm, diarrhea, skin rash, headache, cough, weight loss without dieting, sore throat, back-pain, indigestion, insomnia, fatigue, flu, dizziness, skin problems, toothache, and dysmenorrhea. This question 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 while those who have selected less than five cases were considered to have low self-care orientation. In the fourth section of the questionnaire, the respondents were asked to select and state the reason(s) for practicing self-medication. The list of reasons presented to the respondents were: the ailments were simple and did not require professional medical intervention, there was a previous experience with this type of ailment, lack of trust in the medical services, to save money, others to be stated by the respondent. The fourth part also contained questions regarding who recommended the self-treatment for the respondent. A list of choices was presented which included: self-decision, family and friends, media, herbalist, or others. The last section was designed to assess respondents' medication knowledge based on Isacson and Bingefors [19] methodology. Respondents were presented with six questions that could be answered by 'yes', 'no', or 'I do not know'. Medication knowledge was determined by the number or correct answers to the above six questions. One point was given to each correct answer, one point was deducted for each wrong answer, and selecting 'I do not know' did not affect the total points. Respondents with a total of 1 and above were considered to have good medication knowledge, while those with a total of zero and below were considered to have poor medication knowledge. Respondents who have answered less than four questions were excluded. The questions were: penicillin strengthens the immune system, nose may be blocked up if nasal decongestants were used for more than 10 days, some medications may be absorbed through the skin, whenever the instructions call for 1 tablet twice daily that means you should take one tablet every 8 hours, Acamol® and Febramol® (two locally-available brand names for paracetamol) contain the same active ingredient, the red color on some cough preparations indicate that they may cause drowsiness.

All data were coded, entered, and analyzed using statistical package for social sciences program (SPSS) version 13. Descriptive results were expressed as frequency, percentage, and mean ± S.D. *P*-values < 0.05 were accepted as statistically significant. Pearson Chi-Square was used to test for significant correlation.

Results

A total of 1581 out of 1600 questionnaires were completely filled and returned to the author, giving a response rate of 98.8%. Characteristically, average age for the respondents was 19.9 years old. Most respondents were females (63.3%), studying at non medical schools, and were distributed all through the academic years. The majority also reported to have health insurance, live within an area where a clinic or a pharmacy is close, and were mostly free of chronic diseases. Detailed demographic information is presented in Table 1.

Approximately 98% of the respondents reported that they do practice self-medication. Of those, 37.7% have 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 the males and 98.2% of the females suggesting that the practice of self-medication, in general, was independent of gender or type of school. The most common class of medications used in self-medication was analgesics, in particular, paracetamol which was reported by 86.6% of the respondents. Other common types of medications reported by the respondents were decongestants, herbal remedies and antibiotics (Table 2).

Table1: Demographic characteristics of the respondents.

Variable	Number (%)
Age	
<20 years	658 (41.6)
≥ 20 years	891 (56.2)
Gender	
Male	577 (36.5)
Female	1001 (63.3)
Type of school	
Medical	468 (29.7)
Non-Medical	1112 (73.3)
Academic year	
First	354 (22.4)
Second	496 (31.4)
Third	320 (20.2)
Fourth	305 (19.3)
Fifth	103 (6.5)
Area of residence	
City	731 (46.2)
Village	792 (50.1)
Camp	50 (3.2)
Availability of physician, pharmacy and health care centre near residence.	1092 (69.1)
Have health insurance	922 (58.3)
Used self-medication	1549 (98)
Used self-med in the past month	596 (37.7)

The most commonly utilized herbs were sage, chamomile, anise, and thyme. The average number of medications reported by self-medication practitioners was 2.63 ±1.38 medications (range: 1-11). The most common types of ailments for which the respondents reported to practice self-medication for were headache followed by flu, sore throat, and menstrual pain (Table 3).

Table 2: Medication classes reported in self-medication

Self-medications used	Number (%)	Average number of medication used ± SD
Headache relievers	1370 (86.6)	2.79 ± 1.37
Decongestants	715 (45.3)	3.47 ± 1.30
Herbal remedies	512 (32.4)	3.26 ± 1.42
Antibiotics	314 (19.9)	3.89 ± 1.38
Diarrhea and constipation medications	295 (18.7)	4.09 ± 1.34
Topical treatment or creams	284 (18)	3.897 ± 1.38
Back pain relievers	221 (14)	4.04 ± 1.47
Ulcer medications	159 (10.1)	4.27 ± 1.4
Allergy medications	105 (6.6)	4.28 ± 1.38
Sedatives	69 (4.4)	3.72 ± 1.53
Do not remember	52 (3.3)	2.29 ± 1.65
Others	22 (1.4)	3.82 ± 1.89

This table indicates the number, percentage, and the average number of self-medications consumed by respondents based on the medications that they consume. Some questions had multiple options a respondent could select, therefore, the sum of percentages is not always 100%.

Results indicate that respondents who practice self-medication for headache tend to consume lesser number (2.79± 1.37) of medications than respondents who practice self-medication for allergy or peptic ulcer (4.28 ± 1.38; 4.27 ± 1.4; respectively). There was a positive correlation between the number of medications reported to be consumed and the number of health conditions that respondents would treat by self-medication practice (r^2 = 0.78). When respondents were asked why they practice self-medication, the majority (58%) indicated that they did so because the illnesses were simple, or because they have gained experience from previous episodes (29%). Only 13% 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 them to practice self-medication, the majority reported that they have done so based on self-decision (47%), or based on advice from family and friends (41%). Twelve percent practiced self-medication based on the media or herbalist advice.

Table 3: Health conditions reported to be self-medicated.

Cases for which people tend to self treat	Frequency (%)	Average number of self-medication
Headache	1211 (76.6)	2.77 ±1.41
Flu	731 (46.2)	3.06 ± 1.45
Sore throat	568 (35.9)	3.11 ±1.46
Menstrual pain	549 (34.7)	3.00 ±1.42
Fatigue	463 (29.3)	2.97 ± 1.50
Diarrhea	447 (28.1)	3.24 ± 1.52
Toothache	385 (24.4)	3.03 ± 1.44
Cough	314 (19.9)	3.3 ± 1.49
Insomnia	274 (17.3)	3.03 ± 1.499
Dizziness	264 (16.7)	3.28 ± 1.44
Back pain	219 (13.9)	3.7 ± 1.55
Indigestion	180 (11.4)	3.49 ±1.62
Bronchospasm	137 (8.7)	3.24 ±1.59
Weight loss	96 (6.1)	3.23 ±1.53
Skin problem	77 (4.9)	3.73 ± 1.49
Skin rash	66 (4.2)	3.37 ±1.60
Otherwise	13 (0.8)	2.15 ± 1.52

Some questions had multiple options a respondent could select, therefore, the sum of percentages is not always 100%.

Analysis of the extent of self-care orientation and medication knowledge among respondents revealed that 33.5% of the respondents were considered to have high self-care orientation while 66.5% had low self-care orientation. Approximately two thirds (64.3%) of the respondents have good medication knowledge. Gender has no significant influence on either self-care orientation or medication knowledge. Type of school had significant influence on the extent of medication knowledge but not the extent of self-care orientation.

The extent of self-care orientation and medication knowledge did not have significant influence on whether the respondents practice self-medication or not (Table 4). However, results have shown that the extent of self-care orientation, gender, and the type of school (medical vs. non medical) significantly influenced the type of medications that respondents would use in self-medication practices. For example, respondents with high self-care orientation were significantly different than those with low self-care orientation in self-medicating with analgesics, antibiotics, herbal remedies, decongestant, and all other medication classes tested. Gender had a significant difference on self-medicating with sedatives, medications for allergy, herbal remedies, and medications for diarrhea or constipation. Furthermore, patients from medical schools reported a significant rate of self-medicating on antibiotics, diarrhea and constipation medications, ulcer medications, sedatives, and herbal remedies than those from non medical schools. Good medication knowledge did make a significant difference on respondents who practiced self-medication with herbal remedies, and medications for diarrhea or constipation.

Table 4: Comparison between self-medication practitioners based on gender, type of school, self-care orientation, and medication knowledge

Condition	Number (%) of self-medication practitioners	Average number of self-medication ± SD
Gender:		
Male	562 (36.6%)	2.63 ± 1.38
Female	983 (63.6%)	2.64 ± 1.38
Type of school		
Medical school	451 (29.2%)	2.83 ± 1.46
Non-medical school	1095(70.8%)	2.55 ± 1.34
Self-care		
Self-care oriented	521 (33.7%)	3.5 ± 1.5
Not self-care oriented	1025 (66.3%)	2.2 ± 1.1
Medication Knowledge		
Good medication knowledge	995 (64.4%)	2.70 ± 1.39
Poor medication knowledge	548 (35.4%)	2.53 ± 1.36

Discussion

In Palestine, access to almost all types of medications is easy. The Palestinian pharmacy practice regulations strongly advocates the proper and legal sale of medications, however, in Palestine, as well as in many less developed countries, almost any drug available in the market can be purchased as an over the counter medication. In Palestine, many patients directly purchase medications from the community pharmacies because they are easily accessible, fast and less expensive than going to the doctor's clinic first. This is even more obvious in village areas where medical services are inadequate.

In this study, self-medication was reported to be extensively practiced among the studied population (Table 5). This could be explained, in part, by the higher level of education and self-care orientation among the students since it has been found that self-medication is more prevalent in those with higher education levels (20). The average number of medications reportedly consumed by self-medication was 2.63 ±1.38 per respondent. This is a relatively higher number compared with those reported elsewhere (21). The most common aliments for which self-medication were sought were headache, sore throat, flu, and menstrual pain. Such aliments were also reported to be commonly self treated in other parts of the world (18; 22). In this study, analgesics, decongestants and antibiotics were the most commonly reported type of medications consumed through self-medication. Similar results were found by other researchers in other countries [17;18;21-24].

Paracetamol and other types of NSAIDs were the most common type of analgesics used for self-medication. These results are similar to other studies conducted in other countries [21;25]. There may be two major problems regarding self-medication with analgesics. The first is the possible risk of nephropathy and possible drug-induced gastric ulceration. The second is overuse of analgesics like paracetamol, aspirin or other NSAIDs especially when given in combination since they increase the risk of chronic toxicity among patients. Similar adverse results of self-medication with antibiotics have been reported in other countries [26;27]. In Palestine, antibiotics can be obtained without a prescription. The irrational use of antibiotics might contribute to the development of new resistant bacterial strains in Palestine. Unfortunately, the local medical and pharmaceutical professionals are not educating the public regarding self-medication. Respondents may not make the proper selection of antibiotics. Furthermore, the duration of treatment is usually sub-optimum. Herbal remedies were also commonly used in self-medication practices. This is similar to the situation in other developing countries [3;25;28]. Herbal remedies are commonly utilized in Palestine [29], and many respondents were born in a culture were herbal remedies would be experienced at an early age. Herbal remedies are relatively safe, however, many reports of adverse health effects and drug interactions are there in the literature [30-33].

Our results indicated that gender, levels of self-care orientation and medication knowledge were an insignificant predictor of self-medication practices. Both genders, in the study, were extensively practicing self-medication. In other studies carried out in other parts of the world, the influence of gender on self-medication practices was controversial [25;34].

Although the level of self-care orientation did not significantly influence the extent of self-medication practice, it significantly affected the type of medication that respondents would purchase without medical consultation. Respondents with high or poor medication knowledge have practiced self-medication to the same extent. This is similar to previously published results elsewhere [18].

The reasons cited for self-medication by respondents in this study were similar to those reported in other studies [22;25]. The most commonly reported reasons were simplicity of the illness or previous experience. These reasons might not be strong to justify self-medication. Respondents may not be adequately knowledgeable to judge when to seek medical advice, and for how long the treatment should continue, especially that respondents relied heavily on their own decisions or other people's opinions.

Table 5: Analysis of the most common drug classes and the major variables affecting their selection in self-medication practice.

Drug classes that were self-medicated	Variables	Number of respondents (%)	*P* value
Headache relievers	Males Females	503 (36.7) 869 (63.3)	NS
	Medical Non-med	406 (29.6) 966 (70.4)	NS
	Self-care oriented Not self-care oriented	495 (36.1) 877 (63.9)	S
	Good medication knowledge Poor medication knowledge	889 (64.8) 481 (35.1)	NS
Back pain relievers	Males Females	73 (33.0) 148 (67.0)	NS
	Medical Non-med	68 (30.8) 153 (69.2)	NS
	Self-care oriented Not self-care oriented	129 (58.4) 92 (41.6)	S
	Good medication knowledge Poor medication knowledge	154 (69.7) 67 (30.3)	NS
Antibiotics	Males Females	117 (37.4) 196 (62.6)	NS
	Medical Non-med	118 (37.6) 196 (62.4)	S

	Self-care oriented Not self-care oriented	165 (52.5) 149 (47.5)	S
	Good medication knowledge Poor medication knowledge	209 (66.6) 104 (33.1)	NS
Herbs	Males Females	149 (29.0) 364 (71.0)	S
	Medical Non-med	179 (34.9) 334 (65.1)	S
	Self-care oriented Not self-care oriented	208 (40.5) 305 (59.5)	S
	Good medication knowledge Poor medication knowledge	350 (68.2) 163 (31.8)	S
decongestants	Males Females	275 (38.4) 441 (61.6)	NS
	Medical Non-med	217 (30.3) 499 (69.7)	NS
	Self-care oriented Not self-care oriented	346 (48.3) 370 (51.7)	S
	Good medication knowledge Poor medication knowledge	472 (65.9) 243 (33.9)	NS
Medications for diarrhoea and constipation	Males Females	90 (30.4) 206 (69.6)	S
	Medical Non-med	120 (40.5) 176 (59.5)	S
	Self-care oriented Not self-care oriented	173 (58.4) 123 (41.6)	S
	Good medication knowledge Poor medication knowledge	211 (71.3) 85 (28.7)	S
Ulcer medication	Males Females	67 (42.1) 92 (57.9)	NS
	Medical Non-med	56 (35.2) 103 (64.8)	NS
	Self-care oriented Not self-care oriented	91 (57.2) 68 (42.8)	S
	Good medication knowledge Poor medication knowledge	116 (73.0) 43 (27.0)	NS
Medications for allergy	Males Females	55 (52.4) 50 (47.6)	S

	Medical Non-med	23 (21.9) 82 (78.1)	S
	Self-care oriented Not self-care oriented	65 (61.9) 40 (38.1)	S
	Good medication knowledge Poor medication knowledge	65 (61.9) 40 (38.1)	NS
Topical treatment	Males Females	98 (34.5) 186 (65.5)	NS
	Medical Non-med	90 (31.7) 194 (68.3)	NS
	Self-care oriented Not self-care oriented	157 (55.3) 127 (44.7)	S
	Good medication knowledge Poor medication knowledge	179 (63.0) 105 (37.0)	NS
sedatives	Males Females	33 (47.8) 36 (52.2)	S
	Medical Non-med	14 (20.3) 55 (79.7)	S
	Self-care oriented Not self-care oriented	32 (46.4) 37 (53.6)	S
	Good medication knowledge Poor medication knowledge	37 (53.6) 32 (46.4)	NS

S: statistically signifincant, NS: not significant

Conclusion

In this study, analgesics, decongestants and antibiotics were the most commonly reported type of medications consumed through self-medication. Similar results were found by other researchers in other countries. Paracetamol and other types of NSAIDs were the most common types of analgesics used for self-medication. Gender, levels of self-care orientation and medication knowledge were an insignificant predictor of self-medication practices. The reasons cited for self-medication by respondents in this study were similar to those reported in other studies

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