Self-therapy practices among university students in Palestine: Focus on herbal remedies

Ansam F. Sawalhaa,∗, Waleed M. Sweilehb, Sa’ed H. Zyouda, Samah W. Jabib

a Poison Control and Drug Information Center (PCDIC), An-Najah National University, P.O. Box 7, Nablus, Palestine
b College of Pharmacy, An-Najah National University, P.O. Box 7, Nablus, Palestine

Available online 7 February 2008

Summary
Background: Herbal self-therapy is a common practice among Palestinians. However, no published data are available on herbal self-therapy in the Middle East in general, and in Palestine in particular.

Objective: This study was conducted to (1) determine the extent of herbal self-therapy among university students, (2) investigate the different types of herbal remedies used and (3) investigate the correlates and reasons associated with such practices.

Methodology: This cross-sectional, descriptive study was carried out using a structured questionnaire that contained five sections: (1) demographics; (2) medication knowledge and self-care orientation; (3) types of herbal remedies used; (4) clinical conditions treated; and finally, (5) the reasons reported by students for herbal self-therapy practice. Pearson χ², multiple logistic regression and one-way ANOVA were performed using SPSS 13 program.

Results: 33.9% of the respondents reported using herbal remedies in self-therapy. Female gender, students at medical colleges and those with high self-care orientation were significant predictive model for herbal use. Sage (Salvia fruticosa L.), chamomile (Chamaemelum nobile L.), anise (Pimpinella anisum L.), and thyme (Thymus vulgaris L.) were the most commonly utilized herbal remedies. The types of herbal remedies selected were significantly influenced by gender, but not by the level of medication knowledge or self-care orientation. Herbal remedies were used primarily for the treatment of headache, flu, menstrual pain and sore throat. The main motivating factor for using herbal remedies reported for using herbal remedies was simplicity of symptoms.

Conclusions: Herbal self-therapy was a common practice among university students. Health care providers need to be aware of the students’ self-therapy practices and need to have sufficient knowledge regarding herbs not simply because of the widespread use, but also because of significant reported side effects. Academics need to consider offering courses about herbal remedies to students in both the medical and non-medical faculties to broaden their treatment capabilities during this time of increased unregulated medical interventions such as herbal therapy.

© 2007 Elsevier Ltd. All rights reserved.

∗ Corresponding author. Tel.: +972 599 675501; fax: +972 9 2345982.
E-mail address: ansam@najah.edu (A.F. Sawalha).
Introduction

Herbal self-therapy is a common practice all over the world.1–4 Such practices have benefits and risks. Self-therapy with herbal remedies can reduce the demand for traditional medical services, especially in third world countries where medical resources and services are limited. Furthermore, herbal remedies are less expensive and more readily available than modern medications. However, herbal self-therapy might have serious health consequences due to incorrect self-diagnosis, inappropriate choice of herbal remedy or adulterated herbal product.5 In addition, absence of clinical trials and other traditional safety mechanisms before medicines are introduced to market results in questionable safe dosage ranges which may produce adverse and unexpected outcomes. Therefore, the use of herbal remedies requires sufficient knowledge about the efficacy, safety and proper use of such products.6–8 To do so, it is necessary (1) to have baseline data regarding the use of herbal remedies and (2) to educate future health professionals about various aspects of herbal remedies. One study has found that patient care would be greatly enhanced if physicians became more knowledgeable about herbal remedies and stayed in touch with their patients’ beliefs and practices regarding herbal and other complementary and alternative medicine (CAM) practices.9 Another recent study in the Middle East has recommended that physicians should be encouraged to communicate with patients about the use of complementary medicine in general and herbal remedies in particular.10

Studies regarding the use of herbal remedies among university students have been carried out in many regions of the world.11–13 Most of those published studies concluded that students commonly use and have favorable attitudes toward herbal remedies. However, a PubMed search did not yield results regarding herbal self-therapy among university students in the Middle East where medicinal herbs are an integral part of the culture and religion.

The objectives of this study were to (1) determine the extent of herbal self-therapy among university students, (2) investigate the different types of herbal remedies used and (3) investigate the correlates and reasons associated with such practice. Results of this study are aimed toward: (1) helping plan the interventions needed to improve the self-use of herbal remedies; (2) helping avoid potential drug-herb interactions; (3) helping decision makers in academia to decide on the proper courses to offer for students in the medical and the non-medical majors concerning herbal remedies and other types of CAM; and finally, (4) students at medical colleges are the future health care providers. Investigating student patterns of herbal use can help predict the likelihood of herbal medicine recommendation in the future.

Methodology

Study population

This is a cross-sectional, questionnaire-based, descriptive study carried out during the month of November 2006 among undergraduate students enrolled at An-Najah National University in Nablus. The study population, An-Najah National University, is the largest university in Palestine with approximately 16,000 full-time students. The university offers medical and non-medical education through its 16 different colleges. For the purpose of this study, students enrolled in pharmacy, medicine, or nursing colleges were designated as medical students, whereas all the rest were designated as non-medical students.

Study tool: the questionnaire

A structured questionnaire containing both open-ended and close-ended questions was developed for this study by the Poison Control and Drug Information Center (PCDIC) at An-Najah University. A total of 1600 questionnaires were distributed. Students were given the questionnaire at the beginning of the class and were asked to return it at the end of the class to the instructor, or to drop the completed questionnaire in the mailbox of the PCDIC located at the College of Pharmacy at An-Najah National University.

The questionnaire contained five sections. The first was the demographic section which contained questions regarding age, gender, type of colleges, place of residence, availability of health insurance, and availability of medical services near the residence. In this section, there was also a question investigating whether the student has practiced self-therapy with herbal remedies and/or medications. The second section of the questionnaire consisted of questions related to the types of herbal remedies that respondents have utilized in self-therapy practices. Respondents were asked to write the native name of the herb that they used in self-therapy. The third section of the questionnaire focused on the health conditions that respondents would self-treat with herbal remedies. The third section was also used to assess respondents’ level of self-care orientation. Respondents who indicated that they would self-treat five or more conditions 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. This cutoff point was based on previously published research where respondents who reported that they would treat approximately more than 30% of the listed health conditions were considered to have high self-care orientation.14 In the fourth section of the questionnaire, the respondents were asked to indicate the reason(s) that led them to utilize herbal remedies in self-therapy practices. This part also contained questions regarding who recommended herbal remedies for the respondents. The last section was designed to assess respondents’ medication knowledge based on previous published methodology.14 Respondents were presented with six questions that could be answered by either ‘yes’, ‘no’, or ‘I do not know’. Medication knowledge was determined by the number of correct answers to the six presented questions. Respondents who answered less than four questions were excluded. 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 grade. Respondents with a total of one or above were considered to have good medication knowledge, while those with a total of zero or below were considered to have poor medication knowledge.
Self-therapy practices—Herbal remedies

Statistics and discussion

Characteristics of the study population

A total of 1600 questionnaires were distributed. 1,581 questionnaires were completed and returned, giving a response rate of 98.6%. The mean age ± S.D. of the respondents was 20 ± 1.7 years; and 63.4% of the respondents were females. The majority (70.3%) of the respondents were enrolled at non-medical colleges. Respondents were evenly distributed regarding their place of residence between cities (49%) and villages (51%). Analysis of the health care practices and medication knowledge of the respondents revealed that approximately two thirds of the respondents had low self-care orientation and one third had poor medication knowledge.

Almost all (99%) respondents practiced self-therapy. Based on respondent reports, three types of self-therapy were practiced: (1) self-therapy with both herbal remedies and medications (31.2%; 95% CI: 28.9–33.46%); (2) self-therapy with herbal remedies alone (2.7%; 95% CI: 1.92–3.52%); and (3) self-therapy with medications alone (66.1%; 95% CI: 63.77–68.43%). For the purpose of this project, respondents in the first and second categories were grouped together and called “herbal users” and constituted one third of the surveyed students (33.9%; 95% CI: 31.57–36.23%). The remaining two thirds of the students were called “non-herbal users.”

Table 1 Factors influencing the selection of herbal remedies among the 1581 respondents

<table>
<thead>
<tr>
<th>Factor</th>
<th>Total number</th>
<th>Percentage of respondents using herbal remedies (%)</th>
<th>Odds ratio with 95% confidence intervals for using herbal remedies</th>
<th>$\chi^2$ (P-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1003</td>
<td>37.8</td>
<td>1.2 (1.1–1.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Male</td>
<td>578</td>
<td>27.2</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Type of college</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>469</td>
<td>39.7</td>
<td>1.3 (1.1–1.5)</td>
<td>0.002</td>
</tr>
<tr>
<td>Non-medical</td>
<td>1112</td>
<td>31.5</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Village</td>
<td>821</td>
<td>35.8</td>
<td>1.1 (1.0–1.2)</td>
<td>0.09</td>
</tr>
<tr>
<td>City</td>
<td>760</td>
<td>31.8</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Medical Service near residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available</td>
<td>1287</td>
<td>34.7</td>
<td>1.0 (1.0–1.1)</td>
<td>0.08</td>
</tr>
<tr>
<td>Not available</td>
<td>294</td>
<td>30.3</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Self-care orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>529</td>
<td>40.8</td>
<td>1.3 (1.2–1.5)</td>
<td>0.001</td>
</tr>
<tr>
<td>Low</td>
<td>1052</td>
<td>30.4</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Medication knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>1016</td>
<td>35.8</td>
<td>1.1 (1.0–1.2)</td>
<td>0.03</td>
</tr>
<tr>
<td>Poor</td>
<td>565</td>
<td>30.4</td>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>

Statistical analysis

All data were coded, entered, and then analyzed using the 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 $\chi^2$ was used to test for significant relationships between self-therapy with herbal remedies and demographic factors. The odds ratio (OR) with 95% confidence interval (CI) for self-therapy with herbal remedies was calculated for each category of respondents. Multiple logistic regression was used to establish a predictive model for herbal self-therapy. The factors included in the regression test model were those that were significantly associated with herbal self-therapy as tested by $\chi^2$. One way ANOVA was also used to test whether various factors could significantly affect the selection of the type of herb. Graphics were made using SPSS version 13.

Correlates of self-therapy with herbal remedies

Statistical analysis was carried out to investigate the correlates of self-therapy with herbal remedies (Table 1). Gender ($P = 0.001$), type of college ($P = 0.002$), extent of self-care orientation ($P = 0.001$) and medication knowledge ($P = 0.03$) each had a significant influence on the type of self-therapy chosen. On the other hand, place of residence ($P = 0.09$); and the availability of medical services near the residence ($P = 0.08$) had no significant influence. Table 1 provides the adjusted OR and the 95% confidence intervals (CI) that quantify the association between various factors and herbal self-therapy. Females (OR = 1.2), students at medical faculties (OR = 1.3), students with high self-care orientation (OR = 1.3) and students with good medication knowledge (OR = 1.1) were more inclined to use herbal remedies in self-therapy practices compared to their counterparts (Table 1).

Forward stepwise multiple logistic regression was used to construct a model for the prediction of herbal self-therapy among the surveyed students. Factors included in the regression model were those that had P-values < 0.05 in $\chi^2$ analysis. This kind of analysis adjusts for the influence of all possible confounders i.e. gender, level of self-care orientation, type of college, and the degree of medication knowledge. Being a female student ($P = 0.001$), having high self-care orientation ($P = 0.001$) and being enrolled at a non-medical college ($P = 0.025$) were independently related to using herbal remedies and constituted a significant predicting model of herbal use among university students. The degree of medication knowledge was an insignificant contributor ($P = 0.131$) to the predicting model. Other predictors of herbal self-therapy among the general public were reported in other authors. For example, one Swedish study found that patients who
Figure 1  Types of herbal remedies and their extent of use by respondents. Percentage of users was calculated by dividing the number of respondents reporting the use of a certain herb by the total number of respondents; n = 536.

were females, well-educated, and having chronic diseases had higher odds for herbal medicine use than others irrespective of socio-demographic characteristics. Another study carried out in Ethiopia has found that there was an association between females and herbal remedies use. Types of herbal remedies used in self-therapy

A total of 29 different herbal remedies were reported by respondents (Fig. 1). The most frequently reported types were sage (Salvia fruticosa L.) (27.6%); chamomile (Chamaemelum nobile L.) (23.8%); anise (Pimpinella anisum L.) (19%), and thyme (Thymus vulgaris L.) (7.7%). Other herbal remedies reported are shown in Fig. 1. The herbal remedies reported by the respondents were used as herbal preparation intended for self-therapy rather than being part of their daily food habits. It is noteworthy that some students reported using black tea (Camellia sinensis L.) in herbal self-therapy. Although black tea is considered a common social drink, some students used it in self-therapy practices to treat cough and common cold. Similar findings regarding black tea were reported in another study among patients with asthma who were using coffee and black tea preparations in self treatment.

One hundred and twenty-four (23.1%) respondents reported using only one type of herbal remedy, 34.0% of respondents reported using two different types of herbal remedies, and 32.7% reported using three or more different types of herbal remedies per health episode. Some respondents (10.2%) could not remember the number or the type of herbal remedies that they have used (Fig. 2). A total of 1084 herbal self-therapy episodes were reported by all the respondents, giving an average utilization rate of 2.2 ± 1.0 herbal remedies per respondent. This would suggest that in most clinical conditions, herbal users tend to use a combination of herbs to self medicate. An episode was defined as one reported use of one herbal remedy by one respondent during the study period. The utilization rate was defined as the total number of herbal remedies reported by the respondents divided by the number of respondents.

Safety issues of some reported herbal remedies need to be considered. People who choose to use herbal remedies in self-therapy need to be aware that herbs not only have potential benefits, but also have the potential to cause toxic

Figure 2  Number of different herbal remedies reportedly used in self-therapy by the respondents.
reactions or interact with other drugs. For example, germander (Teucrium polium L.) and senna (Cassia acutifolia L.) can lead to hepatotoxicity, while nigella (Nigella sativa L.) is contraindicated during pregnancy.17–19 Some herbal remedies like chamomile (C. nobile L.) and anise (P. anisum L.) have been reported to potentially increase the risk of bleeding or potentiate the effects of warfarin therapy.20,21 People should know that the marketed herbs do not necessarily have to be proven either safe or effective prior to marketing. Therefore, people should consult pharmacists or another trusted source for information about herbs when used in self-therapy. Furthermore, people in the medical field need to be aware of the different types of herbal remedies available in the country and their potential benefits and risks.

### Influence of gender on the use of herbal remedies

The types of herbal remedies selected by the respondents were significantly influenced by gender. χ² Analysis indicated that the use of sage (S. fruticosa L.), chamomile (C. nobile L.), and peppermint (Mentha piperita L.) was significantly higher (P < 0.05) among females compared to males while there was no such effect observed with the use of other types of herbal remedies (Table 2). One-way ANOVA analysis indicated that the number of herbal remedies used was significantly (P = 0.02) higher in females than males. In contrast, the number of herbal remedies used by the surveyed students was insignificantly influenced by other personal factors. Females had an average utilization rate of 2.34 ± 1.1 herbal remedies while males had an average utilization rate of 2.02 ± 1.0 herbal remedies.

### Conditions treated and reasons for using self-therapy

The main clinical conditions for which respondents reported using herbal remedies were headache (n = 420), followed by flu (n = 266). Other reported conditions are presented in Fig. 3. Different clinical conditions were treated with dif-

---

**Table 2**  Influence of gender on the type of herb selected

<table>
<thead>
<tr>
<th>Type of herb</th>
<th>Total</th>
<th>Female (n = 379)</th>
<th>Male (n = 157)</th>
<th>χ² (P-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sage (Salvia Fruticosa L.)</td>
<td>300</td>
<td>229</td>
<td>71</td>
<td>0.001</td>
</tr>
<tr>
<td>Chamomile (Chamaemelum nobile L.)</td>
<td>258</td>
<td>193</td>
<td>65</td>
<td>0.04</td>
</tr>
<tr>
<td>Anise (Pimpinella anisum L.)</td>
<td>206</td>
<td>153</td>
<td>53</td>
<td>NS</td>
</tr>
<tr>
<td>Thyme (Thymus vulgaris L.)</td>
<td>83</td>
<td>56</td>
<td>27</td>
<td>NS</td>
</tr>
<tr>
<td>Peppermint (Mentha piperita L.)</td>
<td>81</td>
<td>65</td>
<td>16</td>
<td>0.04</td>
</tr>
<tr>
<td>Black tea (Camellia sinensis L.)</td>
<td>61</td>
<td>44</td>
<td>17</td>
<td>NS</td>
</tr>
</tbody>
</table>

Only the most six common herbs were included in the analysis. NS, not significant.

---

**Figure 3**  Health conditions treated with herbal remedies.
Table 3  Published studies on herbal self-therapy among university students

<table>
<thead>
<tr>
<th>Reference</th>
<th>Place where the study took place</th>
<th>Health conditions treated with herbal remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>USA</td>
<td>Flu-like symptoms, musculoskeletal symptoms, pseudoneurological symptoms</td>
</tr>
<tr>
<td>23</td>
<td>UK</td>
<td>Psychological problems, cold and flu, gastrointestinal disorders, skin problems</td>
</tr>
<tr>
<td>24</td>
<td>Australia</td>
<td>Headaches, cold and flu, stress, allergies</td>
</tr>
</tbody>
</table>

Different numbers of herbal remedies. The highest average number of herbal remedies used was 2.4 ± 1 for cough and the lowest was 2.1 ± 1.1 used for losing weight. It could be argued from the type of clinical conditions reported that the respondents based their selection on some cultural beliefs rather than a known scientific fact about the benefits of these herbs. Studies carried out outside this region suggest that a greater diversity of clinical conditions exist for which herbal remedies are used (Table 3).

Motivating factors for herbal self-therapy were also investigated. The most commonly reported motivating factors were simplicity of the symptoms \( (n = 482) \); previous experience with the ailment \( (n = 225) \), lack of trust in modern medicine \( (n = 33) \); to save money \( (n = 33) \); and finally lack of medical service in the residential area of the respondent \( (n = 20) \) (Fig. 4). The simplicity of the symptoms means that symptoms were non-serious and were easy to self medicate. Most respondents practiced self-therapy with herbal remedies based on their own knowledge \( (n = 285) \), or based on advice from family and/or friends \( (n = 272) \). Few respondents learned about herbal remedies from the media, in stark contrast to the market penetration observed in Western societies.

Strengths and limitations of the study

One of the major strengths of this study is that it focuses on self-therapy with one type of CAM and herbal remedies among a niche population. Several of the survey respondents are future health care providers and their knowledge and practice of self-therapy with herbal remedies will likely impact the future of health practices in Palestine. In this study new factors like self-care orientation and medication knowledge were assessed in relation to herbal use. An additional point of strength in this study is that the respondents represented the north of Palestine with more diverse socioeconomic backgrounds which suggests that the results obtained represent the herbal practices among the general public as well.

Limitations to this study include the inability of the researchers to validate the answers reported by the students regarding the type and numbers of herbal remedies used in self-therapy. Some researchers have shown that respondents of questionnaire-based studies tend to underestimate the real situation. However, others have shown that respondents’ answers are reliable and can be used in epidemiological studies. 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 may not be valid among the Palestinian people.

Conclusions and recommendation

Due to the reportedly common use of herbal remedies by undergraduate students and the potential for significant health impact from improper use, an elective course on herbal remedies and CAM should be taught to non-medical students. Furthermore, an evidence-based phyto-therapy course should be taught to medical students to enable them to assess benefits, risks and drug interactions of herbal remedies.

Acknowledgment

The authors would like to acknowledge Dr. Laurie McNeil and Dr. William Qutub for editing the language. The authors would also like to thank the fourth and fifth year pharmacy students at An-Najah National University for their help in data collection.

References

3. Said O, Khalil K, Fulder S, Azaizeh H. ETHnopharmacological survey of medicinal herbal remedies in Israel, the


