

Self-Medication among Healthcare and Non-Healthcare Students at University of Ljubljana, Slovenia

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Key Words

Self-medication · Healthcare and non-healthcare students · Slovenia

Abstract

Objective: To determine the incidence of self-medication among University of Ljubljana students and the effect of the type of curriculum on the pattern of self-medication. **Subjects and Methods:** The study included a sample of 1,294 students who freely accessed a self-administered web-based questionnaire in the Slovene language that consisted of a preliminary letter introducing the term 'self-treatment' and 2 sections about self-medication. The preliminary letter asked participants to report the practice of self-treatment during the past year. The main outcome measures were percentages of those reporting self-medication during the past year, which were then used to compare healthcare and non-healthcare students. **Results:** A majority of students (1,195, 92.3%), both healthcare and non-healthcare, reported the use of some sort of self-medication during the study period. More healthcare students in their senior year (353, 94.1%) than those in their junior year (245, 89.4%) used self-medication ($p = 0.04$). Healthcare students ($p = 0.05$) thought that self-medication without improvement of the symptoms should last for 1 week or less. They acquired the drugs for

self-medication from pharmacies; thought that previous doctors' advice in a similar situation was a more important reason for self-medication; would seek the advice of a physician or pharmacist for different ways of self-treatment, and quite interestingly thought that self-medication was not very safe. On the other hand, non-healthcare students acquired the drugs from healers and friends. **Conclusion:** The study showed that self-medication was common among all University of Ljubljana students, but that healthcare-related education in students and young adults led to more responsible use of self-medication. Copyright © 2010 S. Karger AG, Basel

Introduction

Self-medication is an ordinary yet important part of patients' behavior in coping with illness [1–3]. It is also an important self-care practice [4] used for the most part when an individual encounters common health problems that he/she believes do not require a visit to a doctor. Self-medication is defined as the use of any medication for self-treatment without consulting a healthcare professional [5]. Nowadays, the term 'responsible' self-medication is often used, meaning that the use of appropriate drugs, such as over the counter (OTC) drugs, is limited

only to the situations for which they are necessary [6]. Responsible self-medication requires a certain level of knowledge by those who practice it [7].

Self-medication patterns vary among different populations [5] and are influenced by many factors, such as age, sex, income, self-care orientation and medical knowledge [2, 3, 8, 9]. In particular, self-medication is more common among healthcare professionals (e.g. physicians, nurses and pharmacists) [7, 10] than the general public.

The effect of medical knowledge on self-medication can be studied in different populations, among which university students represent an interesting sample for several reasons. Students use self-medication very often [11–14] and can be divided into two groups according to the assumption of some preexisting scientifically grounded knowledge, i.e. the presence of medical subjects in their curricula, or the lack of such knowledge. Previous studies have shown that type of school and medical knowledge can have an important impact on self-medication among student populations [11], although the general influence is not clear [15, 16]. The influence of medical training on self-medication by students has also been demonstrated [5, 17].

Data concerning the use of different forms of complementary and alternative medicine in Slovenia are scarce [18, 19]. Self-medication in Slovenia seems to be very common among the general population [19]; however, self-medication by the student population in Slovenia has not yet been studied. The present study was therefore conducted to determine the incidence of self-medication and evaluate the impact of the curricula and the year of study on self-medication among the population of University of Ljubljana students.

Subjects and Methods

Study Population

This investigation was conducted in the form of an anonymous, web-based study that sampled students from Ljubljana University, which is the largest one among 4 existing universities in Slovenia and enrolls almost 70% of the total student population in Slovenia. At the time of the study, approximately 53,000 students were admitted to 26 faculties. An effort was made to invite participation from as many as possible of all of the university's faculties by using the internal mailing list of each faculty. The invitation included a link to the questionnaire. Unfortunately, this method was only possible in the Medical School and the School of Pharmacy. For other faculties, other recruitment mechanisms were used, such as placement of the invitation on the official web page of the faculty, on the students' forum, and on electronic chain mail. Respondents were blocked from completing the ques-

tionnaire more than once by denying access to the web page with the questionnaire. Data collection was performed in 2008 from March 30th to April 21st.

The students were divided into healthcare and non-healthcare groups. The following schools were assigned to the healthcare group: Schools of Pharmacy, Medicine, Veterinary Medicine and Health Sciences. The others (Academy for Music, Academy for Art, Faculty of Biotechnical Sciences, Faculty of Economy, Faculty of Social Sciences, Faculty of Electrotechnical Sciences, Faculty of Civil Engineering, Faculty of Mathematics and Physics, Faculty of Maritime Affairs, Faculty of Computer Sciences, Faculty of Social Work, Faculty of Mechanical Engineering, Faculty of Sports, Faculty of Management, Faculty of Philosophy, Faculty of Law, Faculty of Education, Faculty of Theology, Faculty of Logistics, Faculty of Organization Sciences) were assigned to the non-healthcare group. To test the differences between junior and senior students, those enrolled in the first year of study were assigned to the junior group and those enrolled in the sixth year and candidates for graduation were assigned to the senior group. The National Ethics Committee approved the study.

Study Tool: The Questionnaire

The research team developed a self-administered web-based questionnaire, which was prevalidated on a sample of 10 students. Only face validity was tested in order to diminish technical and structural flaws, time needed for completing the questionnaire and general attitude towards such questioning. The questionnaire was in the Slovenian language and consisted of a preliminary letter and 2 sections. The preliminary letter introduced the term 'self-treatment' and asked participants to report the use of self-treatment during the past year. The first section featured questions regarding demographic information [student (yes/no), type of faculty, grade, age, and sex], and the second section focused on self-medication and consisted of 9 questions (see Appendix).

Statistical Analysis

The results from the pilot study were not included in the statistical analysis. Participants who were not students were excluded. SPSS software version 13.0 (SPSS Inc., Chicago, Ill., USA) was used to analyze the data. Frequencies were calculated, and the χ^2 test and independent t test were used for testing statistical significance. The limit for statistically significant differences was $p \leq 0.05$.

Results

The questionnaire was completed by 1,294 students, of which 991 (76.6%) were females and the remaining 303 (23.4%) were males. Demographics of the students studied are given in table 1. The mean age \pm SD of the respondents was 22.4 ± 3.24 years. Students from the non-healthcare group were older than those from the healthcare group (22.5 ± 2.4 vs. 21.7 ± 2.4 years, $p < 0.001$). Of the 1,294 students, 1,195 (92.3%) reported the use of self-medication during the past year. The use of self-medication was reported by 603 (92.8%) of the students from the

Table 1. Demographic data of 1,294 students

	Healthcare students	Non-healthcare students	Total students
<i>Sex</i>			
Female	524 (80.6)	467 (72.5)	991 (76.6)
Male	126 (19.4)	177 (27.5)	303 (13.4)
<i>Year of study</i>			
First	155 (23.8)	123 (19.1)	278 (21.5)
Second	175 (26.9)	137 (21.3)	312 (24.1)
Third	104 (16.0)	139 (21.6)	243 (18.8)
Fourth	56 (8.6)	96 (14.9)	152 (11.7)
Fifth	44 (6.8)	3 (0.5)	47 (3.6)
Sixth	35 (5.4)	0 (0)	35 (2.7)
Candidates for graduation	74 (11.4)	121 (18.8)	195 (15.1)
Unclassified answers	7 (1.1)	25 (3.9)	32 (2.5)

Figures indicate numbers with percentages in parentheses.

healthcare group and by 592 (91.9%) of the students from the non-healthcare group; the difference was not statistically significant (fig. 1). More students from the healthcare group in the last year of study than in the first year of study used self-medication (94.1 vs. 89.4%, $p = 0.038$) (fig. 1). More students from the healthcare group (533; 88.4%) than from the non-healthcare group (473; 79.9%) thought that self-medication without improvement of symptoms should last for 1 week or less ($p < 0.001$).

More students from the healthcare group (555; 92.1%) than from the non-healthcare group (523; 88.4%) bought the drugs for self-medication from pharmacies. On the other hand, more students from the non-healthcare group than the healthcare group obtained them from healers (27; 4.5% vs. 15; 2.5%, $p = 0.049$) and from friends (127; 21.1% vs. 100; 16.2%, $p = 0.027$). The drugs for self-medication were bought from street markets by 7 (1.1%) healthcare students and by 6 (0.9%) non-healthcare students; 16 (2.5%) healthcare students and 19 (3.0%) non-healthcare students bought them from homeopaths, and 173 (26.7%) healthcare students and 192 (30.1%) non-healthcare students obtained them from relatives. These differences were not statistically significant.

Reasons for self-treatment are given in table 2. With respect to not wanting to burden the physician and being able to manage the symptoms by oneself, there was no statistically significant difference between the healthcare and non-healthcare groups. However, for other reasons (reliance on relatives, friends and media; reluctance to seek physician's advice due to long waiting time and un-

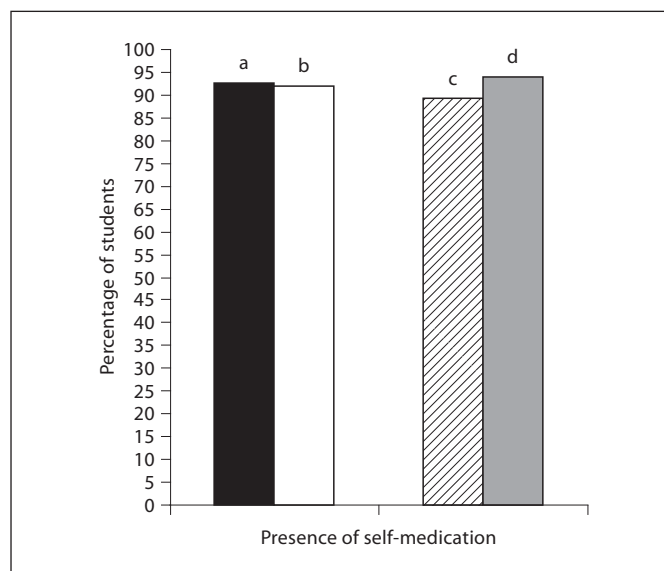


Fig. 1. Self-medication among students. a = Healthcare students; b = non-healthcare students; c = first-year healthcare students; d = last-year healthcare students.

reliable prescription by the physician) the difference was statistically different between the two groups.

In general, students from the healthcare group would seek the advice of a physician or pharmacist for different categories of OTC drugs more often than students from non-healthcare schools (table 3). However, the differences in using different prescription drugs for self-medication were not statistically significant. More students from healthcare schools would seek advice from a physician or a pharmacist in case of sinusitis (61.0 vs. 49.4%, $p = 0.012$), whereas more students from the non-healthcare group than from the healthcare group would seek this advice in case of allergies (72.7 vs. 57.9%, $p = 0.001$). Also, in general, more students from healthcare schools would seek the advice of a physician or pharmacist for different reasons (table 4) and thought that self-medication was not very safe (table 5).

Discussion

Students in Slovenia use self-medication very often. The presence of medical subjects in faculties' curricula does not affect the overall incidence of self-medication among healthcare and non-healthcare students. Nevertheless, there are still some important differences between healthcare and non-healthcare students indicat-

Table 2. Reasons for self-medication (scale: 1 = unimportant, 7 = very important)

Reasons	Healthcare group ¹	Non-health-care group ²	p value (t test)
I don't want to burden my physician because my problems are not important	5.8 ± 1.8	5.8 ± 1.8	0.827
My physician told me that I can manage such symptoms on my own	4.4 ± 2.3	4.2 ± 2.4	0.074
I want to play an active role regarding my health	3.6 ± 2.1	4.0 ± 2.2	0.002
My relatives, friends, media told me that I can manage such symptoms on my own	2.9 ± 1.9	3.5 ± 2.0	<0.001
I don't want to go to my physician due to long waiting time	2.7 ± 2.0	3.1 ± 2.3	<0.001
The prescribed treatment from my physician was not successful	2.2 ± 2.0	2.6 ± 2.2	0.002
I don't trust my physician	1.6 ± 1.4	2.1 ± 1.8	<0.001

¹ 650 students. ² 644 students.

Table 3. Differences between students from the healthcare and non-healthcare groups in using different types of self-medication only after the advice given by a physician or a pharmacist

Type of self-medication	Healthcare students	Non-healthcare students	p value (χ ² test)
Drugs from home pharmacy	275 (68.6)	238 (62.0)	0.061
Over the counter drugs	323 (51.6)	237 (40.2)	<0.001
Herbal teas	86 (16.6)	43 (8.4)	<0.001
Herbs	40 (9.4)	26 (5.6)	0.040
Homeopathic drugs	6 (15.8)	9 (15.8)	1.000
Vitamins and minerals	173 (30.6)	139 (25.0)	0.039
Slimming diet	27 (8.1)	27 (8.9)	0.776
Remedies for muscle mass gain	10 (45.5)	9 (25.7)	0.155

Figures indicate numbers with percentages in parentheses.

Table 4. Reasons for seeking professional help

Reasons	Healthcare students	Non-healthcare students	p value (χ ² test)
Symptoms last for more than a week	641 (99.2)	617 (97.8)	0.038
Symptoms are worsening	646 (99.5)	629 (98.4)	0.054
Presence of severe pain	603 (96.9)	573 (94.4)	0.034
Usual treatment is not effective	639 (99.2)	611 (97.3)	0.009
Side effects	627 (98.0)	592 (95.2)	0.008
When you think that problems are serious	628 (99.2)	595 (96.3)	<0.001
In case of mental problems	572 (94.5)	443 (82.3)	<0.001

Figures indicate numbers with percentages in parentheses.

ing that healthcare students are more cautious about the use of some drugs and remedies and regard self-medication as not completely safe and without side effects (table 5). Possible reasons for these differences include students usually seeking quick relief of illnesses [11], not vis-

iting their doctors very often but rather preferring to act on their own, regarding their symptoms as not very serious and not being aware of possible side effects of unprofessional treatment (table 2). No studies on self-medication among students in Slovenia are available. However,

Table 5. Students' view about safety of self-medication

Item	Healthcare group ¹	Non-healthcare group ²	p value (t test)
Any drug, including herbal ones, has side effects	5.4 ± 1.8	4.7 ± 2.2	<0.001
Simultaneous use of drugs, including herbal ones, can be potentially dangerous	6.6 ± 1.0	6.4 ± 1.3	0.004
Increasing drug dose can be dangerous	6.4 ± 1.1	6.3 ± 1.2	0.076
Lowering drug dose can be dangerous	5.2 ± 1.9	4.8 ± 2.1	0.001
In case of side effects physicians' help must be sought	6.0 ± 1.4	5.7 ± 1.7	<0.001
Using drugs with unknown substances in patients with liver and kidney diseases is very dangerous	6.7 ± 1.0	6.8 ± 1.2	0.080
No drug can be used during pregnancy	4.8 ± 2.2	5.4 ± 2.1	<0.001
Mild medical problems do not need drug treatment	6.6 ± 1.0	6.7 ± 1.0	0.187
Self-treatment can mask the symptoms and signs of diseases so the physicians can overlook them easily	5.4 ± 1.7	4.7 ± 2.2	<0.001

¹ 650 students. ² 644 students.

according to available studies of the general population [19], the incidence among students is higher than in the general population. Studies from other countries report a similar incidence among students [11, 20] in comparison to the incidence among Ljubljana University students found in our study. The finding that the incidences of self-medication between healthcare and non-healthcare students do not differ significantly can be compared to some studies [15, 16] and contrasted to others [11]. Namely, Sawalha [11] reported less common use of self-medication among medical students.

It appears that the presence of medical subjects in faculties' curricula affects the attitude of students toward different aspects of self-medication, especially those regarding its safety. Hence, healthcare students are more aware of the possible risks of inappropriate and unsafe self-medication and therefore are more cautious. The fact that senior healthcare students practice self-medication more often than their junior colleagues is most probably due to increased medical knowledge [17].

Our finding that more students from the non-healthcare group than from the healthcare group use herbs confirmed the previous study of Sawalha [11]. On the other hand, another study [21] demonstrated that students from the colleges of pharmacy and nursing used fewer antibiotics compared to non-healthcare students. More students from the non-healthcare group would seek professional help in case of allergies. Similarly, Sawalha [11] reported that more healthcare students would self-medicate with antiallergic medications. It seems that the students' use of some drugs for self-medication is not affected by medical knowledge [21]. It is not yet possible to find any reasonable explanation for these findings.

A somewhat expected finding of this study is that healthcare students practice self-medication more often

according to advice that their doctor had given them previously in a similar health situation in the past, whereas non-healthcare students prefer media, internet, relatives and friends rather than physicians as a source of advice. Healthcare students are also more aware of the importance of taking an active role regarding their own health. This is consistent with other studies [5, 17] and indicates that medical knowledge enhances trust in medical workers and increases awareness of their own health.

The most important finding of this study was that considerably larger numbers of non-healthcare students regarded self-medication to be safe and without side effects, resulting in an unsafe and inappropriate practice of self-medication. Thus, it is very important that students be exposed to proper and adequate information regarding self-medication, especially regarding the management of minor medical problems. Since it is known that students rarely visit physicians, pharmacists may play a crucial role in education regarding self-medication patterns. It is therefore important that pharmacists be made aware of this so that they may devote more time to patient education when faced with students seeking information on self-medication.

The main strength of this study is the large sample of students, which allowed us to draw generalized inferences. There are several limitations. The data collection process was web-based, but we did not track the number of 'hits' in order to find out how many students viewed the invitation. We also did not know the number of students without computer access, even though this is presumably less than 1%. Due to the web-based methodology the identity of respondents could not be verified. Sex and age differences between the healthcare and non-healthcare group could be a source of possible bias because of the known effect of sex and age on self-medication patterns [22].

Conclusion

Self-medication was very common among university students, hence healthcare providers should take this fact into consideration. We recommend that basic health-related knowledge become part of the curricula in all university programs and be made available in multiple sources, including those students most often use.

Appendix: The Second Section of the Questionnaire

Q1: Did you use self-medication in the past year (including OTC, herbal and homeopathic drugs, vitamins and minerals)? Options: yes, no, I don't know.

Q2: Where, in the past year, did you obtain the drugs and remedies for self-medication? Options: pharmacy, street market, homeopath, healer, relatives and friends, neighbors.

Q3: Please mark, on a scale from 1 to 7, how important the following reasons for self-medication are to you (1 means that the reason is not important and 7 means that the reason is very important):

- (a) I don't want to burden my physician because my problems are not important,
- (b) my physician told me that I can manage such symptoms on my own,
- (c) I want to play an active role regarding my health,
- (d) my relatives, friends, media told me that I can manage such symptoms on my own,
- (e) I don't want to go to my physician due to long waiting time,
- (f) the prescribed treatment from my physician was not successful,
- (g) I don't trust my physician.

Q4: How long, in the past year, did you use self-medication if the symptoms had not improved? Options: one week or less, more than one week, I don't know.

Q5: In the past year, how did you use the following remedies for self-medication: drugs from home pharmacy, OTC drugs, herbal teas, herbs, homeopathic drugs, vitamins and minerals, slimming diet, remedies for muscle mass gain. Options: I used them according to the advice that the doctor had given me in the past when I had such symptoms, I used them by myself or by advice of my relatives, friends and media, I don't know.

Q6: In the past year, how did you use the following drugs: antibiotics, antiviral drugs, topical antimycotics, benzodiazepines, antidepressants, antacids, acetylsalicylic acid, paracetamol, non-

steroid antirheumatic drugs, topical corticosteroids, nasal decongestives and antihistamine drugs? Options: I used them according to the advice that the doctor had given me in the past when I had such symptoms, I used them by myself or by advice of my relatives, friends and media, I don't know.

Q7: In the past year, how did you act in case of the following health problems: unplanned weight loss, urethra discharge, back pain, toothache, mild injuries, headache, rectal bleeding, muscle or joint pain, diarrhea, heartburn, cold or flu, anxiety, warts, vomiting, sore throat, sinusitis, fever, allergic rhinitis, nose bleeding, cough, obesity, earache, allergies, depression, general poor feeling, and nasal discharge. Options: I acted according to the advice that the doctor had given me in the past when I had such symptoms, I acted on my own or by advice of relatives, healers and media, I don't know.

Q8: In the past year, what were the reasons for seeking professional help? Options for each statement: yes, no, I don't know:

- (a) symptoms last for more than a week,
- (b) symptoms are worsening,
- (c) presence of severe pain,
- (d) usual treatment is not effective,
- (e) side effects,
- (f) when you think that problems are serious,
- (g) in case of mental problems.

Q9: Please mark, on a scale from 1 to 7, how important the following statements about the safety of self-medication are to you (1 means that the reason is not important and 7 means that the reason is very important):

- (a) any drug, including herbal one, has side effects,
- (b) simultaneous use of drugs, including herbal ones, can be potentially dangerous,
- (c) increasing drug dose can be dangerous,
- (d) lowering drug dose can be dangerous,
- (e) in case of side effects physicians' help must be sought,
- (f) using drugs with unknown substances in patients with liver and kidney diseases is very dangerous,
- (g) no drug can be used during pregnancy,
- (h) mild medical problems do not need drug treatment,
- (i) self-treatment can mask the symptoms and signs of diseases so the physicians can overlook them easily.

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