

A Cross Sectional Study of Sex Differences in Self-Medication Practices among University Students in Slovenia

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ABSTRACT

Self-medication patterns in adults depend on sex. Self-medication among students is very common, but little is known about the influence of sex. The aim of the study was to determine the incidence of self-medication college students and to determine the effect of sex on self-medication patterns. A web based incidence study conducted on a sample of Slovenian university students. The main outcome measures were percentages of male and female students reporting the use of self-medication in the past year. A majority of students (92.3%) reported the use of some sort of self-medication in the past year. Most female students (94.1%) and most male students (90.9%) reported the use of self-medication in the past year. The difference was not statistically significant. More female students than male ones ($p < 0.05$) acquired the drugs for self-medication in pharmacies, used OTC drugs, herbal teas, herbs, vitamins and minerals, remedies for muscle mass gain, antibiotics, benzodiazepines, antacids, acetylsalicylic acid, topical corticosteroids, and nasal decongestives only with the advice of physicians or pharmacists, and thought that increasing drug dosage can be dangerous, that in case of side effects physicians' help must be sought, that no drug can be used during pregnancy, and that self-treatment can mask the symptoms and signs of diseases so the physicians can overlook them easily. Sex appears to be important factor in self-medication patterns even in young adults, such as students. The physicians should actively seek the presence of self-medication in this population. Inappropriate or unsafe use should be properly addressed and managed.

Key words: self-medication, students, sex, attitude, incidence study

Introduction

Self-medication is an important part of patients' medical behaviour¹⁻³. In fact, it is usually the first choice for treatment of early symptoms of diseases⁴ and one of the most important tools used when an individual encounters common health problems, which do not require a doctor visit⁵. Studies have shown that women use self-medication more often than men⁶⁻⁹. Besides treating themselves, women are known to play the most important role in the family regarding the management of health problems of family members¹⁰. They are also more frequent users of health services than men¹¹⁻¹³. However, the use of self-care is also associated with age; people of more than 65 years of age use it more often^{6,14-16}.

Adolescents and young adults are the most vulnerable groups regarding different influences on their health-related decisions. Especially students are an im-

portant group of patients which we know little about when it comes to health-related problems and health care utilisation, including self-medication. Family bonds loosen in this group, whereas new social networks mostly heed needs other than solving health related problems. They often make unsupervised health-related decisions and, perhaps for the first time, bear the responsibility for those decisions¹⁷. For students, the main source of information on medicines is still their parents^{18,19}, but they are highly influenced by the media and the internet which for different reasons promote self-medication behavior¹⁸. The reliability of information from the media is difficult to assess, so fragile youngsters can sometimes be exposed to information that is not proven scientifically and is sometimes underpinned by consumerism.

Students from different countries appear to use non-prescription drugs and herbal or dietary supplements very often^{18,20–22}, and at a higher rate than the general population²³. So far, studies have shown a controversial effect of sex on self-medication patterns. In summary, sex appears to affect some aspects of self-medication in university students' population, but in general researchers have not found any important sex differences in the use of self-medication^{18,19,24}.

Self-medication in Slovenia seems to be very common among the general population²⁵. Self-medication among the student population in Slovenia has not yet been studied. In the present study we wanted to determine the incidence of self-medication and evaluate the effect of sex on self-medication practices among the Slovenian university student population. We anticipated a very high incidence of self-medication among university students and an impact of sex on some aspects of self-medication.

Subjects and Methods

Study population

This cross-sectional study was anonymous and web-based. Our target population were students at the University of Ljubljana, the largest university in Slovenia. Approximately 53,000 students were enrolled at 26 different faculties at the time of the study. We provided the web-based platform to all students by using internal mailing list of each faculty. The invitation included a link to the web-questionnaire. Data collection was performed in a three-week period in 2008, from March 30th to April 21st.

The National Ethics Committee approved the study, No. 187/12/08.

Study tool: The questionnaire

The research team developed a self-administered web-based questionnaire, which was pre-validated in a pilot study in order to diminish any technical and structural flaws.

The questionnaire consists of two sections. The first section contains questions regarding demographic information (type of faculty, grade, age, and sex) and the second focused on the attitude and practice of self-medication. The second part contains nine questions (Appendix 1).

Statistical analysis

The participants who stated that they were not students were excluded from the final sample. The SPSS software version 13.0 (SPSS Inc., Chicago, IL, USA) was used to enter and analyse all data. The frequencies were calculated. The chi-square test and independent t-test were used for testing statistical importance. The limit for statistically important differences was $p=0.05$.

Results

1294 students filled out the questionnaire. 1059 (81.8%) came from the following seven faculties: 300 (23.2%) from Medical Faculty, 194 (15.0%) from Faculty of Pharmacology, 129 (10.0%) from Faculty of Civil Engineering and Geodesy, 125 (9.7%) from Faculty of Health Care, 114 (8.8%) from Faculty of Biosciences, 110 (8.5%) from Faculty of Education and 87 (6.7%) from Academy of Fine Arts and Design. The remaining 235 students (18.2%) came from 42 other faculties. 991 (76.6%) of the respondents were female. The mean age (SD) of the respondents was 22.4 (3.24) years. 278 (21.5%) of them were first-year students, 312 (24.1%) second-year students, 243 (18.8%) third-year students, 152 (11.7%) fourth-year students, 47 (3.6%) fifth-year students, 35 (2.7%) sixth-year students, 195 (15.1%) candidates for graduation, and 32 (2.5%) were unclassified answers.

1195 (92.3%) of students reported the use of self-medication in the past year. 925 (94.1%) of women and 270 (90.9%) of men reported the use of self-medication in the past year. The difference in using self-medication according to sex was not statistically significant. 41 (18.4%) of

TABLE 1
SEX DIFFERENCES IN USING OF PRESCRIPTION DRUGS FOR SELF-MEDICATION

Drug	Number (and %) of men	Number (and %) of women	χ^2 -value	p value
Antibiotics	82 (70.1)	332 (82.4)	8.448	0.006
Antiviral drugs	19 (33.9)	81 (46.6)	2.747	0.121
Topical antimicrotics	22 (40.0)	100 (49.5)	1.566	0.226
Benzodiazepines	266 (87.8)	939 (94.8)	17.571	<0.001
Antidepressives	8 (32.0)	32 (55.2)	3.757	0.060
Antacides	17 (11.8)	99 (20.3)	5.381	0.020
Acetylsalicylic acid	24 (9.6)	114 (14.9)	4.509	0.034
Paracetamol	28 (10.4)	119 (13.1)	1.341	0.293
Non-steroid antirheumatic drugs	28 (20.3)	169 (26.2)	2.110	0.161
Topical corticosteroids	15 (30.0)	69 (47.6)	4.689	0.033
Nasal decongestives	20 (15.2)	125 (25.2)	5.930	0.015
Antihistamine drugs	40 (37.3)	175 (48.1)	3.537	0.076

TABLE 2
SEX DIFFERENCES IN USING OF DIFFERENT TYPES OF SELF-MEDICATION ONLY AFTER THE ADVICE GIVEN BY A PHYSICIAN OR A PHARMACIST

Type of self-medication	Number (and %) of men	Number (and %) of women	χ^2 -value	p value
Prescribed drugs from home pharmacy	107 (59.4)	406 (67.1)	3.598	0.061
OTC drugs	97 (36.5)	463 (48.8)	12.696	<0.001
Herbal teas	18 (7.8)	111 (13.9)	6.031	0.013
Herbs	6 (3.1)	60 (8.6)	6.795	0.008
Homeopathic drugs	5 (16.7)	10 (15.4)	0.025	1.000
Vitamins and minerals	38 (15.0)	274 (31.6)	26.704	<0.001
Diet	10 (9.5)	44 (8.3)	0,182	0.701
Remedies for muscle mass gain	7 (20.0)	12 (54.5)	7.255	0.01

TABLE 3
SEX DIFFERENCES IN AGREEMENT WITH DIFFERENT ITEMS ABOUT THE SAFETY OF SELF-MEDICATION

Item	Men (mean (SD) of answers)	Women (mean (SD) of answers)	p value
Any drug, including herbal one, has side effects	5.0 (2.1)	5.1 (2.0)	0.348
Simultaneous use of drugs, including herbal ones, can be potentially dangerous	6.4 (1.3)	6.5 (1.1)	0.056
Increasing of drug dose can be dangerous	6.2 (1.3)	6.4 (1.1)	0.001
Lowering of drug dose can be dangerous	4.8 (2.1)	5.1 (2.0)	0.071
In case of side effects physicians' help must be sought	5.4 (1.8)	6.0 (1.5)	<0.001
Using of drugs with unknown substances in patients with liver and kidney diseases is very dangerous	6.6 (1.2)	6.7 (1.1)	0.193
No drug can be used during pregnancy	4.8 (2.4)	5.2 (2.1)	0.001
Mild medical problems do not need drug treatment	6.5 (1.2)	6.7 (1.0)	0.084
Self-treatment can mask the symptoms and signs of diseases so the physicians can overlook them easily	4.8 (2.1)	5.1 (2.0)	0.018

men and 111 (15.0%) of women thought that self-medication with no improvement of the symptoms should last for one week or less. The difference was not statistically significant.

More women than men used antibiotics, benzodiazepines, antacids, acetylsalicylic acid, topical corticosteroids, and nasal decongestives for self-medication (Table 1).

More women than men acquired the drugs for self-medication in pharmacies (92.7% vs. 82.2%, $\chi^2=28.649$, $p<0.001$). 293 (29.7%) of women and 72 (24.0%) of men acquired them from relatives, 191 (19.3%) of women and 49 (16.3%) of men from friends, 37 (3.7%) of women and 8 (2.7%) of men from healers, 27 (2.7%) of women and 8 (2.7%) of men from homeopaths, and 11 (1.1%) of women and 2 (0.7%) of men from street markets. Those differences were also statistically insignificant.

In general, women would seek advice of a physician or pharmacist on using different ways of self-treatment more often than men (Table 2). More women than men would seek advice from a physician or pharmacist in case of mild injuries or sprains (30.7% vs. 20.4%, $\chi^2=11.075$, $p=0.001$), sinusitis (58.7% vs. 43.8%, $\chi^2=8.257$, $p=0.005$)

and cough (14.6% vs. 9.1%, $\chi^2=5.786$, $p=0.017$). In case of obesity more men than women would seek professional help (7.1% vs. 2.3%, $\chi^2=4.593$, $p=0.043$).

Women would seek professional help more often than men in case of drugs' side effects (97.5% vs. 93.5%, $\chi^2=10.871$, $p=0.003$) and in case of psychological problems (anxiety, depression) (90.5% vs. 83.1%, $\chi^2=10.895$, $p=0.002$). In cases of symptoms that last for more than a week, worsening of symptoms, strong pain and no effect in their treatment, no significant differences according to sex were found in seeking professional help.

Women thought that self-medication was not as safe as men did (Table 3).

Discussion

Students in Slovenia use self-medication very often. Sex has not shown any influence on the incidence of self-medication. Yet female students seem to be more cautious about the use of some drugs and remedies and regard self-medication as not completely safe and without side effects.

Since there are no studies about self-medication of students in Slovenia, the results could not be compared. However, according to available studies in general population²⁵, the incidence among students found in our study is higher than in general population.

Studies from other countries report of a similar incidence^{18,19}. Our study could not find any sex differences regarding the overall use of self-medication, which is in accordance with some studies^{18,20}, and in contradiction with the findings of other studies^{19,24}. We found some differences regarding sex in various aspects of self-medication. For example, female students more often than their male colleagues seek professional help when buying and using drugs as well as other remedies for self-medication. This is particularly true when it comes to some potentially dangerous prescription drugs, such as antibiotics and benzodiazepines. Moreover, there are sex differences in most categories of drugs and remedies use for self-medication, indicating that female students use them more cautiously and with greatest care. Lucas and co-workers²⁴ reported of the same differences regarding the use of vitamins and minerals, antibiotics and analgesics, and Abahussain and colleagues¹⁹ regarding the use of analgesics, and products for dermatological and respiratory diseases. The reason for the lack of statistically significant sex differences in the overall use of self-medication could be due to the study format that allowed for the self-selection of respondents. On the other hand, large numbers of respondents contribute to the strength of this study. Another reason, especially for controversial literature data, could also be the broad definition of self-medication, which contains various methods the use of which is not examined with a rigorous methodology and it is thus difficult to compare the study results.

An interesting finding of our study, which to our knowledge was not reported elsewhere, was the sex difference among students in attitudes towards self-medication. Namely, female students more often than their male colleagues think that self-treatment can be dangerous because it can mask symptoms of diseases and that it can be dangerous to increase drug dosage on your own. In addition, female students, more commonly than male students, believe that during pregnancy no drugs can be safely used and in case of side effects professional help must be sought.

Nevertheless it seems that sex is an important variable in self-medication not only in older adults, but also in younger ones. Probably the patterns regarding family health, in which women play crucial part, are adopted by their daughters. Although the incidence of use of self-medication in students is almost equal between both sexes, the role of women in family health results in more cautious and responsible patterns of self-medication, perceptible even at a younger age.

The results of this study are important for two reasons. The first is that it verifies a very high incidence of self-medication among the student population. Since young adults are among less frequent medical care attendees, it is important that their physicians actively and

regularly ask about their self-medication habits. The second reason is the sex differences in several fields of self-medication, which put male students in a vulnerable position regarding the safety of self-medication. Physicians should pay special attention to them and try to explain to them the right and safe ways of self-medication. Both reasons are of a particular importance because the patterns regarding self-medication that are learnt at a younger age will also continue into older age, and, if they are unsafe or vague, will affect the health status.

The main strength of this study is that of a relatively homogenized sample when it comes to age and education level. This is important because it eliminates any previously known effect of age or education on self-medication. The limitations are mainly connected to a relatively small proportion of students in the sample if compared to the whole number of students, and in possible selection bias due to a non-randomly selected sample. That is why this study could not be generalised to the whole population of students without taking into account possible selection bias, and the differences found should be explained with care. 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 which is one of the limitations of this study. Also, the methodology of the web-based survey could itself be a source of limitation. Namely, by using this kind of study design the results can be biased. However, the large number of studies using a web-questionnaire that have been conducted show such methods to be a suitable and reliable research tool when researching university students^{26,27}. The final limitation of our study could be the fact that about one third of the respondents had some medical background and this could have influenced the results since medical students were shown to differ from non-medical students regarding self-medication^{18,28}. Further studies of students' self-medication in Slovenia and abroad should include larger and random samples, and should focus also on the effect of medical knowledge and the year of study.

Conclusions

The incidence of self-medication among Slovenian students is very high. Important differences regarding the use of drugs and remedies for self-medication and regarding attitudes toward self-medication exist among this population. Unsafe and incorrect patterns of self-medication among students should be actively addressed and remedied in order to enable them a safe and useful self-medication later on in life.

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STUDIJA PRESJEKA SPOLNIH RAZLIKA KOD PRAKSE SAMOLIJEČENJA MEĐU STUDENTIMA U SLOVENIJI

SAŽETAK

Obrasci samoliječenja kod odraslih ovise o spolu, a samoliječenje među studentima vrlo je često. No, vrlo malo toga se zna o utjecaju spola na taj fenomen. Cilj ovog istraživanja bio je utvrditi stopu samoliječenja studenata i utjecaj spola na njegove obrasce. Na uzorku slovenskih studenata je provedeno istraživanje putem interneta i glavni rezultati su bili postotak studenata i studentica koji su prijavili samoliječenje u protekloj godini. Većina studentica (94,1%) i studentica (90,9%) su se izjasnili pozitivno, a razlika nije bila statistički značajna. Više studentica od studenata ($p < 0,05$) je lijekove nabavljalo u ljekarnama, koristilo biljne čajeve, bilje, vitamine i minerale, dodatke prehrani za povećanje mišićne mase, antibiotike, benzodijazepine, antacide, acetilsalicilnu kiselinu, kortikosteroide, dekongestivne kapljice za nos, no sve uz savjete liječnika i ljekarnika. Također više studentica smatra da povećana doza lijekova može biti opasna, da se kod nuspojava mora potražiti pomoć liječnika, da se nikakvi lijekovi ne smiju koristiti u trudnoći te da samoliječenje može vrlo lako zamaskirati simptome i znakove bolesti, zbog čega ih liječnik lako može previdjeti. Čini se da je spol vrlo bitan faktor kod obrazaca samoliječenja, čak i kod mlade populacije, poput studenata. Zbog toga bi liječnici neprestano trebali istraživati prisutnost samoliječenja u ovoj populaciji i prijavljivati pogrešnu ili opasnu upotrebu lijekova.

APPENDIX 1: The second section of the questionnaire

Q1: Did you use the 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, neighbours.

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 in 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 a long waiting period,
- f) the prescribed treatment from my physician was not successful,
- g) I don't trust my physician.

Q4: In the past year, for how long did you keep using self-medication if 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 it according to the advice the doctor had given me in the past when I was having such symptoms, I used it by myself or upon advice from relatives, friends, and media, and 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 use it according to the advice that doctor gave me in the past when I had such symp-

toms, I use it by myself or to the advice of my relatives, friends, and media, and I don't know.

Q7: In the past year, how did you act in cases of the following health problems: unplanned weight loss, urethra discharge, back pain, toothache, mild injuries, headache, rectal bleeding, muscle or joint pain, diarrhoea, 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 the doctor gave me in the past when I had such symptoms, I acted on my own or upon advice from relatives, healers, and media, and 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) my belief that the problems are serious,
- g) in case of mental problems.

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

- a) any drug, including herbal ones, has side effects,
- b) simultaneous use of drugs, including herbal ones, can be potentially dangerous,
- c) increasing drug dosage can be dangerous,
- d) lowering drug dosage can be dangerous,
- e) in case of side effects physicians' help must be sought,
- f) using drugs with unknown substances with patients having liver and kidney disease 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 easily overlook them.