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AWARENESS OF SAFE USE OF OVER-THE-COUNTER DRUGS AMONG NURSING STUDENTS

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ABSTRACT

The aim of the present study was to determine the degree of awareness regarding safe use of over-the-counter drugs. The study population included nursing students of the Faculty of Health Sciences in Slovenia. A cross sectional study was conducted between Feb'and Apr'2013. Descriptive statistics were determined to illustrated participant's characteristic. A t-test was used to determined gender-based differences and the contingency coefficient for determining differences per place of residence, age, the consultant for the use of over-the-counter drugs and the number of over-the-counter drugs taken within the last month. The majority of the participants will read instructions for safe use before using the over-the-counter drug, with a statistically significantly higher incidence in women (p = .021). Participants re-read the instructions after deciding to increase the dosage of the over-the-counter drug, with a statistically higher incidence in men (p = .014). It is important to raise awareness of the seriousness of self-medication among nursing students. Thus, safe use of over-the-counter drugs to improve health.

Keywords: drugs, shopping habits, knowledge, dose increase

INTRODUCTION

Factors from our environment (be they biological, psychological or social) positively or negatively affect how we experience health and sickness. Health and sickness manifest themselves physically, mentally and socially [1]. The modern person desires an active role in achieving and maintaining personal health; when health issues arise, this means self-help with medication available over the counter [2]. Because caring for personal well-being by boosting your health and disease prevention by altering your lifestyle is being promoted, it is important to assume responsibility for personal health and autonomous self-medication [1]. The use of over-the-counter drugs has been on the rise and is expected to continue to grow [3,4]. Drugs are made available over the counter for the users to take responsibly and at their own risk. In Slovenia, over-the-counter drugs may be purchased in pharmacies, specialist shops and online, with customers typically making the purchase at a pharmacy [5,6]. The use of over-the-counter drugs is very frequent in Slovenia, particularly among women, employed persons and students [6]. The choice to self-medicate depends on a number of factors, such as the severity of the symptoms, previous experience with similar symptoms, the time needed to visit a doctor, known or predicted costs of a prescription drug (e.g. co-payments) in comparison to the costs of an over-the-counter drug, as well as the availability and accessibility of over-the-counter drugs [7]. Self-medication is a form of medical treatment performed by persons on themselves, who therefore also assume all responsibility for the treatment, meaning that they diagnose themselves and choose a form of therapy with the medication available in a pharmacy over the counter [7]. Over-the-counter drugs can frequently alleviate common medical issues quickly and effectively [8,9].

The benefits of over-the-counter drugs typically outweigh the risks, with the risk of abuse being low as over-the-counter drugs are typically used to treat mild self-diagnosed conditions [8]. In spite of this, it is

important that the user is advised by a professional on correct, safe and effective use of the drugs. Over-the-counter drugs are only safe and effective when used in accordance with the supplied instructions and the instructions provided by a pharmacist or other medical personnel [10]. When purchasing or using over-the-counter drugs, it is important to be aware of the limits of self-medication. Although over-the-counter drugs are typically safe for use, the user needs to be aware of their properties as this is the only way to prevent inadequate or incorrect treatment. Reading the instructions is therefore a vital step in obtaining information about the correct application of over-the-counter drugs [9]. Misconceptions are frequent in medication use, as is the inability to understand the enclosed patient information leaflet correctly [11]. It needs to be emphasised that over-the-counter drugs are only beneficial to the user when taken correctly. Over-the-counter drugs may be abused deliberately or accidentally [4].

Common abuses include taking doses which are higher or more frequent than recommended [12]. Following the instructions for use is a challenge with both prescription and non-prescription drugs. There is, however, a higher probability that a user will not receive any instructions from a professional on using over-the-counter drugs than prescription drugs [12]. For this reason, it is all the more vital that the user reads the instructions on the safe use of the drug in full. Hernandez [12] has found that users read the instructions selectively and frequently pay insufficient attention to the active ingredient and the safe use of the drug. Even if the medication is used correctly, side effects or interactions with other drugs may arise, with alcohol in particular [7]. Self-medication among the students of the University of Ljubljana typically increases towards the end of their studies, with students of medical professions assuming more responsibility when self-medicating [5].For this purpose, safe use of over-the-counter drugs should be analyzed, which is the main objective of this study. The question arises as to the optimal way to encourage safe self-medication among young adults with medical training. The majority of drugs used in self-medication in Slovenia are purchased in pharmacies, meaning that their use is controlled by pharmacists [6]. In spite of this, incorrect uses of over-the-counter drugs may occur.

Therefore, the aim of the present study was to determine when nursing students purchase over-the-counter drugs, the number of individual drugs taken within the last month, whether the students read patient information leaflets for over-the-counter drugs and are familiar with the active ingredient, how to determine the dosage and concentration of the drug and whether they exceeded recommended dosages, with respect to socio-demographic characteristics.

MATERIAL AND METHOD:

Study design, period and population: A cross sectional study was conducted between February and April of 2013. The sample included 241 nursing students, a first-cycle programmed in the Faculty of Health Sciences in Slovenia, in the 2013/2014 academic year. The nursing students were informed about the purpose of the study, with their identities kept anonymous, and that their participation was voluntary.

Data collection: Data was collected by an anonymous questionnaire. The questionnaire was designed for the purposes of the study and was based on similar studies [5,6,13,14]. It included socio-demographic data, questions pertaining to situations in which the participants may buy over-the-counter drugs or read instructions for use of over-the-counter drugs, questions about whether they know the active ingredient, the concentration and dosage for children under 12 years of age and whether they have taken higher-than-recommended doses. The Cronbach's alpha coefficient was used to calculate the questionnaire's consistency, with the resulting value of 0.682. Instructions for filling out the questionnaire were enclosed. 65.8% of correctly filled-out questionnaires were included in the analysis.

Data analysis: The data were analysed statistically using the SPSS 20 software package (SPSS Inc., Chicago, Ill., USA). The study calculated descriptive statistics, a t-test for determining gender-based differences and the contingency coefficient for determining differences per place of residence, age, the consultant for the use of over-the-counter drugs and the number of over-the-counter drugs taken within the last month. A p-value ≤ 0.05 was defined as significant for all the analyses.

Ethical issues: Permission to perform this research was obtained from Nursing Department management. Students were informed about the purpose of research before its implementation.

RESULTS

The 241 participants nursing students (17.4% men and 82.6% women); their age ranged from 18 to 30 years (mean 20.43) were included in the study. 53.9% of the participants nursing students lived in rural

areas, while 18.3% lived in suburban and 27.8% in urban areas. In 68.5% of the participants nursing students, taking over-the-counter drugs was their personal choice, while it was recommended to them by their doctor in 12.9% of the cases or their pharmacist in 7.9% of the cases. 33.6% of the participants in the study had been taking one over-the-counter drug within the last month; 14.9% had been taking two; 7.1% three; 1.2% between four and five, with 43.2% taking no over-the-counter drugs. The majority of the participants (68.9%) said they purchased over-the-counter drugs when experiencing health issues (Table 1).

An overwhelming majority (93.4%) read the instructions for use enclosed with over-the-counter drugs. Significantly more women read the enclosed instructions for over-the-counter drugs ($t = 2.389$; $p = .021$). 46.9% read the instructions upon first purchase of the over-the-counter drug, while 33.6% read them upon first taking the over-the-counter drug. The latter is more frequent in women, while men research the drug before purchase ($t = 1.688$; $p = .014$). There was a statistically significant difference in purchasing over-the-counter drugs with respect to their consultant ($CC = .342$; $p < 0.0001$); those who consult a pharmacist purchase the drug after the emergence of symptoms and before seasonal conditions, while those who had consulted a physician purchase the medicine in case the symptoms break out.

The majority of participants (81.3%) read the directions for administering the over-the-counter drug, with a significantly larger share of women doing so ($t = -3.615$; $p = .001$); 75.9% read the instructions on dosage; 74.3% read the description of potential adverse side effects, with the share of women being significantly higher ($t = -3.715$; $p < 0.0001$); 70.5% read the instructions on when the drug is not to be taken without a prescription, with women being significantly more likely to do so ($t = -2.620$; $p = .011$); 66.0% read the list of symptoms the over-the-counter drug treats, with a significantly higher incidence among persons living in rural areas ($CC = .160$; $p = .042$) and women ($t = -3.715$; $p < 0.0001$); 60.2% read the drug's therapeutic effects; 51.5% read the warnings about simultaneously taking the over-the-counter drug with other medications, and these are read significantly more frequently by women ($t = -3.513$; $p = .001$), as is the section about taking the drug during pregnancy and breastfeeding ($t = -2.036$; $p = .046$); the dosage and the duration of the treatment ($t = -3.662$; $p = .001$) and drug storage ($t = -3.323$; $p = .001$) (Table 2). The participants taking several different medications also read the instructions on concomitant use of the drug with other drugs and there is some indication of statistical significance ($CC = .183$; $p = .079$).

When subsequently taking the same over-the-counter drug, 66.0% of the participants re-read the instructions if a significant amount of time had elapsed since the last use. 29.9% also re-read it when taking the over-the-counter drug concomitantly with a prescription drug, and 16.6% when taking the over-the-counter drug concomitantly with another over-the-counter drug (Table 3). Those who re-read the instructions after increasing the dosage were advised to take the over-the-counter drug by a doctor ($CC = 230$; $p = .004$). Instructions are also re-read by those who are concomitantly administering several over-the-counter drugs to a child ($CC = 202$; $p = .036$).

118 (49.0%) of the study participants believe they know the active substance in the drug. Only 14 (5.8%) know that the child's weight plays a vital role in determining the dosage for a child under 12, 7 (2.9%) are not familiar with determining the dose for children and 35 (14.5%) gave an incorrect answer. 33 (13.7%) of the participants are aware that over-the-counter drugs for babies contain a higher concentration of the drug in comparison with over-the-counter drugs for children over 12, with a statistically significant share of women ($t = 2.024$; $p = .048$); 34 (14.1%) are not familiar with this fact and 174 (72.2%) answered incorrectly.

130 (53.9%) of the participants have taken a higher-than-recommended dose of an over-the-counter drug, with a statistically significant proportion of men ($t = -2.611$; $p = .011$); 101 (41.9%) have never exceeded the recommended dose, while 10 (14.1%) of the participants in the study do not recall if they did.

Users increased the recommended dosage of over-the-counter drugs by taking a greater number of pills in a single dose in 21.6% of cases, with this being significantly more common in men ($t = 2.816$; $p = .007$), while in another 21.6% of cases, the dose was taken earlier than prescribed. There was some indication of statistical significance for persons living in urban areas exceeding their daily dose ($CC = .153$; $p = .055$). Persons older than 21 years of age believed a higher dosage would relieve symptoms more quickly at a statistically significant rate ($CC = .193$; $p = .002$); (Table 4). There is no significant correlation between the reason for increasing the dosage and the consultant or the number of over-the-counter drugs taken within the last month. Reasons listed for increasing the dosage included severe symptoms (36.9%), while 14.1% experienced no relief after

taking the recommended dosage, which is significantly more common in persons living in urban areas (CC = .162; p = .040). A statistically significant share of men (t = 3.395; p = .001) and persons over 21 years of age (p = .002) believed that they would experience relief more quickly, as shown in Table 4.

The participants in the study believed it to be very likely that severe symptoms would be the reason for increasing the dosage (69.3%), while they considered faster relief (51.5%) and the belief that the over-the-counter drugs were too weak (33.6%), which is statistically more significant in persons over 21 years of age (CC = .213; p = .022), to be likely causes. They also believed an increase in dosage was unlikely if they had already taken prescription drugs (42.3%), which is statistically more significant in persons living in urban areas (CC = .291; p = .004; Table 5). The participants in the study believe an increase in dosage was very likely if the drug was fluid (36.5%), with some indication of statistical significance for persons over 21 years of age (CC = .192; p = .056). They held an increase to be likely if the drug was in the form of globules (34.0%), significantly more common in the urban population (CC = .295; p = .003), or drops (34.0%), and unlikely if the drug was a chewable tablet (35.3%) (Table 5).

DISCUSSION

A third of the participants in the study had been taking one over-the-counter drug within the last month. Over two thirds of the participants purchase over-the-counter drugs when experiencing health issues. Over-the-counter drugs are effective and fast in treating medical problems and it is unsurprising that nursing students mostly decide to purchase them after they have experienced symptoms.

The packaging of the drugs differs; however, they are all required to contain a general patient information leaflet [15]. Nearly all participants read the instructions enclosed with an over-the-counter drug; the share is significantly higher in women. Nearly half of the participants read the instructions for use after first purchasing the over-the-counter drug, while a third of the participants read them before first taking the drug. Women read the instructions before first use of the drug at significantly higher rates, while men tend to research the product before purchase. Half of adult Americans read the instructions before first use of an over-the-counter drug [13]. Reading the instructions is important to ensure safe use of medicines. The findings of this study are contrary to the findings of a study in Ohio, which found a high proportion of adolescents and young adults did not read instructions for use when taking over-the-counter drugs [9]. The differing results may be the consequence of the professional background of the participants. The importance of reading instructions before using over-the-counter drugs and consulting your doctor about risks and adverse side effects is also highlighted in all radio and television advertisements in Slovenia. The participants in the study most frequently read information about the use of the over-the-counter drug, the instructions on dosage, the description of potential adverse side effects, warnings when not to take the drug and its therapeutic effects, with the above being more common in women. Reading symptom descriptions is significantly higher in persons living in rural areas and women. Participants frequently believe that reading information about adverse side effects may alarm them or even cause adverse side effects to appear [16]. If the over-the-counter drug is used again at a later date, 70.1% of the participants will re-read the enclosed instructions if they are taking a concomitant prescription drug and 66% will do so if a long time has elapsed since the instructions were last read. Men are significantly more likely to re-read the instructions after deciding to increase the dosage of an over-the-counter drug. A majority of adult Americans (77%) re-read the instructions for use if giving the drug to their children, if a long time has elapsed or if they have taken a prescription drug [13]. Klemenc-Ketiš and colleagues [5] have found that students in medical fields at the University of Ljubljana approached self-medication with more caution, especially when taking drugs not free of side effects, than students of non-medical fields, who believed that taking over-the-counter drugs was safe and free of side effects. Among Brazilian students, students of medical fields and wealthy students were also found to be better informed about over-the-counter drugs than students of non-medical fields and economically disadvantaged students [17]. Patients frequently do not re-read instructions if they have done so in the past [16].

A drug contains an active ingredient and an excipient. Active ingredients are all pharmacologically active drug ingredients or ingredients intended for use in diagnosing, treating or preventing illness, or have a pharmacological effect on the structure or functioning of the human body. A drug may contain several active ingredients [18]. Half of the nursing students are familiar with the effects of the over-the-counter drugs they are taking, which is likely to be the consequence of their professional training. Only a third of adult Americans are familiar with the active ingredient of their over-the-counter drug [13]. Patient awareness of the adverse side effects and drug

toxicity is weak; however, awareness increases when the user reads the instructions for use [19]. The users are more frequently interested in the therapeutic effects of the over-the-counter drug than its potential adverse side effects. Klemenc-Ketiš and colleagues [5] have found that students in medical fields thought it was important to consult a physician before self-medicating and that they believed self-medication was not very safe, in comparison to students of non-medical fields. They choose to self-medicate to avoid burdening the physician and because they are confident they themselves can manage the symptoms, which should last no longer than seven days [5].

The age of the patient needs to be taken into account when administering the dose. Children under 12 years of age require smaller amounts of the medicine than adults [20]. Physicians generally prescribe the dosage in accordance with the child's weight or size, something only 5.8% of nursing students were aware of, a surprising finding considering their professional background. 21% of adult Americans were aware of this fact [13]. A mere 13.7% of the participants in the study, with a significantly larger share of women, were aware of the fact that the concentration of active ingredients is higher for children under 12 than for children over 12 years of age. 11% of adult Americans were aware of this fact [13].

A half of the participants in the study have ever taken a higher-than-recommended dose of an over-the-counter drug; while only a third of adult Americans have done the same [13]. In 21.6% of cases, they used more pills in a single dose or took the dose earlier than prescribed. The most frequent reason given was severe symptoms. Persons living in urban areas were more likely to increase the dosage because they experienced no relief after the initial recommended dosage. Men were more statistically likely to believe increasing the dosage would relieve symptoms more quickly. Both of these beliefs expressed by nursing students are wrong. If mild symptoms arise, it is recommended to take over-the-counter pain relief medication immediately to increase its effectiveness [21]. In migraines, treating headaches within an hour after symptoms have begun reduces the duration and the severity of the headache compared to treating the headache after an hour [21]. Nursing students believed that people deliberately took higher-than-recommended doses of the drug in the hope of alleviating symptoms more quickly and due to the belief that over-the-counter drugs were too weak to cause health issues. The participants in the study also believed that an increase in the dosage was most likely to occur with fluid medication. The largest concern is the belief that over-the-counter drugs and preparations are absolutely safe, with no adverse side effects or interaction, and that they can be used with no concern [22]. The importance of caution when taking over-the-counter drugs is demonstrated by the fact that it is ibuprofen which is most frequently linked to deadly side effects [16].

CONCLUSION

It needs to be stressed that this study does come with limitations due to its small sample size, which only included nursing students of a single Slovenian faculty, meaning that the findings cannot be generalised to all Slovenian nursing students or nurses as a professional group. The findings indicate that the majority of participants read the instructions enclosed with over-the-counter medication, nearly a half of them when first purchasing the drug and a third before taking the drug. Most frequently read sections are information about the use of the over-the-counter drug, the instructions on dosage and its potential adverse side effects. It bears repeating that safe use requires reading the instructions both before using the drug as well as after a considerable amount of time has elapsed since it was last used. Only sufficient knowledge of the drug enables safe use and immediate identification of adverse side effects. The most alarming finding of the study was the extremely inadequate knowledge about determining the dosage and concentration of medications for children under 12. The lack of knowledge among nursing students should be remedied by education measures. The study also found that half of the participants had taken a higher-than-recommended dosage or had taken the dosage earlier than prescribed despite their medical training. The most common cause was severe symptoms. The findings lead us to conclude that users do not follow instructions for use if faced with severe symptoms. Inadequate knowledge is an all too common cause of increased risks associated with taking a drug or even abuse of the drug. Users and nurses in particular must be aware of responsible conduct to ensure better health. The autonomy of self-medication must therefore translate into responsible, safe use of over-the-counter drugs.

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CONFLICT OF INTEREST:

The authors declare no conflict of interest.

Table 1 The purchase of over-the-counter drugs and reading instructions for use

	n	%	Gender		Place of residence		Age		Consultant		Number of OTC	
			t	p	CC	p	CC	p	CC	p	CC	p
When do you buy over-the-counter drugs			-,994	,324	,108	,831	,161	,095	,342	**,000**	,171	,839
When I am experiencing health issues	166	68,9										
Before health issues arise so that I have access to the drug	36	14,9										
Just in case	29	12,0										
Other	10	4,1										
Do you read the enclosed instructions for use			2,389	**,021**	,088	,393	,029	,651	,045	,920	,075	,852
Yes	225	93,4										
No	16	6,6										
When do you read the enclosed instructions			1,688	**,014**	,101	,869	,078	,684	,181	,520	,251	,180
After the initial purchase	113	46,9										
Before first use	81	33,6										
I research the drug before purchase	36	14,9										
Other	11	4,6										

Table 2 Information read by the users in the instructions for use for over-the-counter drugs

Reading information from the text	n	%	Gender		Place of residence		Age		Consultant		Number of OTC	
			t	p	CC	p	CC	p	CC	p	CC	p
Method of administration	196	81,3	-3,615	**,001**	,139	,092	,035	,590	,141	,180	,102	,639
Therapeutic effects	145	60,2	-1,783	,080	,025	,926	,089	,167	,112	,384	,130	,390
Dosage instructions	183	75,9	-1,068	,290	,094	,345	,057	,377	,155	,114	,096	,692
Symptom description	159	66,0	-3,715	**,000**	,160	**,042**	,037	,561	,141	,182	,107	,594
Times when no drug should be taken	170	70,5	-2,620	**,011**	,063	,615	,001	,983	,114	,364	,112	,552
Concomitant use	124	51,5	-3,513	**,001**	,084	,421	,005	,941	,019	,993	,183	,079
Pregnancy and breastfeeding	60	24,9	-2,036	**,046**	,058	,665	,022	,736	,073	,733	,138	,320
Operating vehicles and machinery	86	35,7	-1,497	,139	,098	,311	,011	,867	,110	,397	,104	,625
Dosage and duration of the treatment	133	55,2	-3,662	**,001**	,061	,634	,044	,490	,077	,694	,163	,159
Adverse side effects	179	74,3	-1,837	,072	,061	,642	,007	,912	,094	,546	,111	,556

Alcohol interaction	81	33,6	-1,173	,245	,108	,243	,080	,210	,108	,419	,043	,979
Storing the drug	77	32,0	-3,323	**,001**	,064	,606	,076	,238	,140	,184	,115	,523
Additional information	48	19,9	-1,661	,101	,025	,926	,053	,407	,144	,166	,129	,398

Table 3 Reading the instructions when retaking the same over-the-counter drug

Cases of re-reading the instructions	n	%	Gender		Place of residence		Age		Consultant		Number of OTC	
			t	p	CC	p	CC	p	CC	p	CC	p
For a child	24	10,0	,431	,668	,015	,973	,079	,217	,127	,269	,202	**,036**
Concomitant use of a prescription drug	72	29,9	-,587	,560	,112	,218	,005	,932	,166	,076	,088	,760
A long time has elapsed	159	66,0	-1,608	,113	,090	,376	,107	,093	,110	,403	,123	,448
Concomitant use of a non-prescription drug	40	16,6	-1,605	,113	,063	,616	,055	,389	,109	,409	,176	,104
Dosage increase	22	9,1	1,878	,066	,083	,435	,061	,345	,230	**,004**	,048	,968

Table 4 Increase in dosage of an over-the-counter drug

	n	%	Gender		Place of residence		Age		Consultant		Number of OTC	
			t	p	CC	p	CC	p	CC	p	CC	p
Type of dosage increase												
Higher number of pills	52	21,6	2,816	**,007**	,020	,955	,084	,192	,024	,987	,123	,446
Dose taken early	52	21,6	-1,417	,161	,021	,946	,021	,748	,101	,479	,154	,212
More doses	31	12,9	,735	,465	,153	,055	,060	,354	,028	,979	,059	,931
I do not know	20	8,3	1,667	,102	,082	,445	,053	,410	,120	,317	,123	,450
Reasons for increasing the dosage												
Fast effectiveness	29	12,0	3,395	**,001**	,062	,631	,193	**,002**	,093	,549	,155	,206
Severe symptoms	89	36,9	1,186	,240	,096	,329	,045	,489	,078	,687	,179	,093
No previous relief	34	14,1	-1,059	,293	,162	**,040**	,010	,873	,071	,749	,129	,399
Previously taken a prescription drug	1	0,4	1,878	**,066**	,103	,271	,085	,186	,044	,927	,090	,739

Table 5 The probability of increasing over-the-counter drug dosage in the population in the opinion of the participants

	Very likely n(%)	Likely n(%)	M	SD	Gender CC	Gender p	Place of residence CC	Place of residence P	Age CC	Age p
Reasons for exceeding the recommended dosage										
Severe symptoms	167 (69,3%)	67 (27,8%)	4,64	0,62	-1,107	,274	,162	,593	,136	,339
A higher dosage relieves symptoms more quickly	72 (29,9%)	124 (51,5%)	4,07	0,79	-,670	,505	,177	,451	,082	,801
Over-the-counter drugs are too weak	20 (8,3%)	81 (33,6%)	3,22	0,99	,118	,906	,224	,124	,213	**,022**
Already taken a prescription drug	10 (4,1%)	36 (14,9%)	2,78	0,92	1,192	,239	,291	**,004**	,176	,103
The form of the drug used to increase the dosage										
Globules	62 (25,7%)	82 (34,0%)	3,76	0,96	1,330	,188	,295	**,003**	,112	,546
Fluid	88 (36,5%)	86 (35,7%)	4,03	0,91	-1,329	,189	,141	,771	,192	,056
Chewable tablets	53 (22,0%)	66 (27,4%)	3,38	1,03	-,426	,672	,156	,647	,127	,417
Drops	69 (28,6%)	82 (34,0%)	3,78	1,02	-1,726	,089	,156	,644	,145	,271

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