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RESEARCH ARTICLE

Sociodemographic Characteristics Of The Over-The-Counter Drug Users In Serbia

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Abstract:

Background:

The analysis of socio-demographic factors on the use of over-the-counter drugs for self-medication and over the counter drugs such as vitamins and minerals for boosting the immune system.

Objective:

The objective is to look into socio-demographic factors of the interviewees who use Over-the-Counter drugs.

Methods:

Data obtained through the results of the National health survey of the Republic of Serbia 2013. Dependent variable was transformed such a way that vitamins and herbal medicaments for strengthening the body were merged into one group preparations for boosting the immune system and drugs for self-treatment into the group preparations for self-medication.

Results:

The interviewees more often use OTC for boosting the immune system rather that OTC for self-medication. Women and highly educated people use OTC preparations more often. Unemployed people coming from rural areas use OTC preparations less often. People who have primary education buy OTC products for boosting the immune system significantly more often in comparison to highly educated people (OR = 3.95), but they use OTC drugs for self-medication less frequently (OR = 0.25). The poorest interviewees buy OTC drugs for self-medication twice times less often than the rich, respectively, but they buy OTC vitamins and other immunoregulators 1.4 times more often than the rich, respectively.

Conclusion:

Highly educated, rich and people coming from developed regions very often buy OTC drugs for self-medication, while poor, less educated people coming from undeveloped regions more often buy OTC preparations for boosting the immune system.

Keywords: OTC, Socio-demographic factors, Drugs for self-treatment, Vitamins, Herbal medicaments, Immune system.

1. INTRODUCTION

According to the Law of medicines and medical devices of the Republic of Serbia, medicine is defined as a product

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aimed at preventing or treating illness and improving physiological functions. Drugs can be given without a prescription. Medicine and additional medical devices which could be bought without a prescription are called "Over the Counter Drugs" (OTC). These preparations are usually safe to use due to its therapeutic range and minimum toxicity, and they have been used in Serbia for about ten years now. OTC preparations include: vitamins and minerals, antihistamines to be applied locally, non-narcotic analgesics and antipyretics, drugs for treating eye and ear diseases, drugs for a local and oral treatment of nasal mucosa, secretolytics and mucolytics, laxatives, antifungals and anti-rheumatic drugs to be used locally, and the OTC list of drugs is determined by the Ministry of Health of the Republic of Serbia [1].

The leader in introducing OTC preparations on the market was the United States of America. Namely, OTC drugs were introduced to USA about twenty years ago and today there are over 300.000 registered OTC drugs [2].

Numerous researches show an increase in the number of people all around the world who are practicing self-treatment, which consequently leads to an increased need for OTC drugs [3 - 5].

Self-treatment and the use of OTC drugs without consulting a doctor have some advantages, but they also carry some disadvantages. The main advantage is the fact that it enables an individual to actively and independently decide about their own treatment, it saves time and reduces the number of visits to a doctor and generally reduces the work load on doctors, it reduces the time spent in waiting rooms for a check-up and health care expenses [6]. However, individual expenses are rising, there are more side effects, there may be some dosage errors, as well as masking some serious disease symptoms which could stay unrecognized for a longer period of time [7, 8].

Socio-demographic characteristics of OTC users as well as the analysis of the relation between OTC drug use for self-medication and vitamins for boosting the immune system could be interesting for both the creators of the health care policies and for many pharmaceutical companies which run businesses on the territory of the Republic of Serbia.

2. THE GOAL OF THE RESEARCH

The goal of the research is to look into socio-demographic factors of the interviewees who use OTC drugs for self-medication and OTC vitamins and minerals for boosting the immune system.

3. MATERIAL AND METHODS

For the purpose of the study, data obtained through the National research on health condition of the population in the Republic of Serbia in 2013 were used [9]. The total number of interviewees was 14082, aged 18 and more.

3.1. The Cause

In the study, the national representative sample was used; type of the sample was stratified two-stage sample, without repetition. The size of the sample was determined based on the recommendations of the European commission [10] and the results of the Project "Health surveys in the EU: HIS and HIS/HES evaluations and models" [11]. Sample frame included all the households listed in the population census in 2011. For obtaining a random sample, two techniques were used: stratification and multistage sampling. Stratification was conducted in such a way that each geographical area (Vojvodina, Belgrade, Sumadija and West Serbia, East and South Serbia) represents one and the main stratum in the sample. Moreover, each stratum is divided into city areas and other areas. Two-stage sampling included municipalities as units of the first stage and households as units of the second stage selected using linear method of sampling with a random start and uniform step of choice.

Two different kinds of questionnaires were used in the study, namely one questionnaire for the household and the other for the face to face interview.

The transformation of the dependent variable "Have you used any drugs, curatives or vitamins in the past two weeks which were not prescribed by your doctor?" was done in the following way: Vitamins, minerals and herbal preparations (for strengthening the body and treating illnesses) were merged into one variable called OTC preparations for boosting the immune system, and all the other preparations included painkillers, drugs for treating specific diseases, antibiotics, drugs for regulating blood pressure, tranquilizers, drugs for insomnia, improving digestion and drugs for constipation which an interviewee could buy in a pharmacy without a prescription were merged into a second variable called OTC drugs for self-medication.

3.2. Statistical Analysis

Data were described by descriptive statistical methods and analyzed using methods for analyzing differences (χ^2 test and t test), and regression analysis (binary logistic regression).

Descriptive statistical methods which were used include percentages as indicators of structure, mean as an arithmetic mean and standard deviation as a measure of variability.

Testing the significance of differences between categorical variables was conducted using Chi-Square test. Testing the significance of the differences between the ages of interviewees, as a continuous variable, in relation to the type of OTC product was conducted using t test. The analysis of predictors in OTC preparation use was conducted using binary logistic regression.

In the representation of the results, there is a value of probability (p) and significant values were considered those where $p \leq 0.05$. All data were processed in SPSS (Statistical Package for the Social Sciences) 19.0 program.

4. RESULTS

The sample included 14082 interviewees. Out of the given number, 3966 (27.1%) interviewees used drugs/curatives from the group of OTC preparations in the last two weeks. The analysis of the interviewees who used OTC preparations show that in the last 2 weeks 56% (2170) of the interviewees used vitamins and other preparations for boosting the immune system while 44% (1703) of the interviewees used OTC for self-medication. Average age of the interviewees who used OTC preparations was 50.83 ± 16.84 and those who used OTC vitamins were 2 years older on average than interviewees who used OTC for self-medication which represents a statistically significant difference ($p < 0.05$).

Women and highly educated people use OTC drugs more often. The poorest people buy OTC drugs least frequently and when they do, they buy drugs for self-medication rather than vitamins. Every fifth citizen of Belgrade buys vitamins, and drugs for self-medication are most often used by citizens of Sumadija and West Serbia as well as South and East Serbia. Unemployed people and those coming from rural areas, as well as those who have never visited a specialist use OTC drugs very rarely. Every third interviewee who has a chronic disorder uses OTC drugs. Out of the interviewees who were on a sick leave in the last year, vast majority used OTC drugs from the group of vitamins for boosting the immune system. The interviewees who consider their health as very good very often don't use OTC drugs (Table **1**).

The results of the binary logistic regression for the use of OTC drugs for self-medication and for boosting the immune system show that statistically significant predictors for the use of both kinds of OTC drugs were the same: education level, well-being index and region. The strongest predictor for the OTC drug use was education. Therefore, people who have primary or secondary education use OTC drugs for self-medication 0.3 and 0.6 less often than highly educated interviewees, respectively. In contrast to that, interviewees who have finished primary or secondary school most often buy OTC vitamins and drugs for boosting the immune system. Namely, people who have elementary education or high school education use OTC vitamins and herbal preparations for boosting the immune system 4 times and twice as often than highly educated people, respectively. When we consider financial situations of our interviewees, it can be concluded that the poorest people and middle class use OTC drugs for self-medication twice or 0.7 times less often than the rich, respectively. As far as OTC vitamins and herbal immunoregulators are concerned, the situation is completely opposite. The poor interviewees use OTC vitamins 1.4 and 1.9 times more often that the rich. Citizens of Sumadija and West Serbia use OTC drugs for self-medication 0.6 times less often that the citizens of South and East Serbia, but they use OTC vitamins and preparations for boosting the immune system significantly more often (twice as often) than citizens of South and East Serbia (Table **2**).

Table 1. The use and the type of OTC drugs in relation to socio-demographic characteristics and health condition of the interviewees.

Variable	Non-OTC users (n,%)	OTC for boosting the immune system (n,%)	OTC for self-medication (n,%)	p
Age	51.1±18,37	51,65±17,34	49,78±16,13	<0.05
Sex				
Male	5152 (79,4)	698 (10,8)	637 (9,8)	<0.001
Female	5057 (66,6)	1472 (19,4)	1066 (14)	
Education level				

(Table 1) contd.....

Variable	Non-OTC users (n,%)	OTC for boosting the immune system (n,%)	OTC for self-medication (n,%)	p
Primary	3141 (75,9)	435 (10,5)	561 (13,6)	<0.001
Secondary	5515 (72,1)	1205 (15,8)	929 (12,1)	
Tertiary education	1553 (67,6)	530 (23,1)	213 (9,3)	
Well-being index				
Poor class	2439 (77,3)	266 (8,4)	451 (14,3)	<0.001
Middle class	6076 (71,8)	1345 (15,9)	1044 (12,3)	
Rich class	1694 (68,8)	559 (22,7)	208 (8,5)	
Region				
Vojvodina	2498 (72,9)	532 (15,5)	395 (11,5)	<0.001
Belgrade	2046 (68,1)	627 (20,9)	331 (11)	
Sumadija and West Serbia	3299 (77,6)	405 (9,5)	547 (12,9)	
South and East Serbia	2366 (69,5)	606 (17,8)	430 (12,6)	
Place of residence				
Urban	5592 (70,4)	1517 (19,1)	833 (10,5)	<0.001
Other	4617 (75,2)	653 (10,6)	870 (14,2)	
Self-perceived health				
Very good	2048 (82,2)	260 (10,4)	183 (7,3)	<0.001
Good	3538 (72,2)	720 (14,7)	639 (13)	
Fair	2773 (67,3)	751 (18,2)	599 (14,5)	
Bad	1455 (71,4)	346 (17)	237 (11,6)	
Very bad	390 (75)	89 (17,1)	41 (7,9)	
Chronic disease status				
Yes	4315 (68,8)	1180 (18,8)	779 (12,4)	<0.001
No	5871 (75,5)	987 (12,7)	915 (11,8)	
Visit a specialist				
In the past 12 months	3950 (67,6)	1224 (20,9)	672 (11,5)	<0.001
Before 12 months and more	4758 (74,6)	800 (12,5)	820 (12,9)	
Never	1247 (80,8)	118 (7,6)	178 (11,5)	
Sick leave				
Yes	391 (59,3)	160 (24,3)	108 (16,4)	<0.001
No	2813 (73,6)	557 (14,6)	454 (11,9)	

5. DISCUSSION

The analysis of the OTC drug use on a national level enables us to understand not only the scope of use but also the type of OTC drugs used, as well as to define predictors for specific population groups in relation to their socio-demographic characteristics and health condition. The possibility of self-medication reduces the number of visits to a doctor and general work load of doctors [12, 13]. More detailed analysis of the interviewees who buy OTC drugs for self-medication, which one can get in the pharmacy for free with a prescription, provides medical policy makers with information related to the work quality and organization of the health care system, as well as possible reasons for not providing necessary health care services.

It frequently happens that people use drugs prescribed by doctor alongside with OTC drugs. In Serbia, the prevalence of polypharmacy and OTC drug use in the elderly aren't different from other industrialized countries although there is a risk of interaction of OTC drugs with other drugs, and patients are obliged to inform a doctor about the OTC drug they use [14, 15]. Paradoxically, the least safe OTC drugs for self-medication are most often used, especially antibiotics and nonsteroidal anti-inflammatory drugs, both in Serbia and in some countries of Europe and the world [16 - 19]. Self-medication among students of School of Medicine, University of Belgrade showed that 79.9% students used it. The most frequently self-prescribed medications were analgesics [20]. Similarly, resarch self-medication practice and used drugs for self-medicaton among medical and pharmacy students in Croation in period 1977-2001 showed that was a routine practice and difference between the 2001 and 1977 surveys was not found. The students were most often used NSAIDs and antibiotics that they had in their homes [21].

The role of the pharmacist during the process of buying OTC drugs is enormous. However, numerous researches conducted in Australia, Japan, Argentina and Canada question their professionalism and their role in the entire system

[22 - 25].

The analysis of the OTC drug users according to gender shows that in most of the studies, women use OTC drugs significantly more often; however, there are results that show the contrary [26, 27]. The analysis of the type of OTC drugs shows that older people and people suffering from chronic diseases use OTC drugs for self-medication more often than OTC vitamins and minerals for boosting the immune system, which is completely opposite to our results [28].The factor of education in the OTC drug use is very significant both in our study and in many other studies [29 - 31]. More educated interviewees use OTC drugs for self-medication more often [27]. The results of the research show that poor interviewees buy OTC drugs for self-medication less often and that could be explained with the fact that certain drugs can be obtained for free with a prescription, which was confirmed in numerous previous studies [32, 33].

Table 2. Predictors for the OTC drug use for self-medication and for boosting the immune system.

Variable	OTC use for self-medication		OTC for boosting the immune system	
	Odds ratio (95% CI)	p	Odds ratio (95% CI)	p
Age	0.99 (0.98-1.01)	>0.05	1.01 (0.99-1.01)	>0.05
Sex				
Female	1		1	
Male	0.88 (0.69-1.12)	>0.05	1.14 (0.89-1.45)	>0.05
Education level				
High school	1		1	
Elementary school	0.25 (0.15-0.43)	<0.001	3.95 (2.32-6.71)	<0.001
Middle school	0.57 (0.43-0.75)	<0.001	1.75 (1.33-2.32)	<0.001
Well-being index				
Rich class	1		1	
Poor class	0.54 (0.31-0.96)	<0.05	1.85 (1.05-3.27)	<0.05
Middle class	0.72 (0.54-0.97)	<0.05	1.39 (1.03-1.87)	<0.05
Region				
South and East Serbia	1		1	
Vojvodina	0.99 (0.71-1.41)	>0.05	1.01 (0.71-1.41)	>0.05
Belgrade	1.03 (0.74-1.44)	>0.05	0.97 (0.7-1.35)	>0.05
Sumadija and West Serbia	0.59 (0.42-0.82)	<0.05	1.71 (1.22-2.41)	<0.05
Place of residence				
Other	1		1	
Urban	1.2 (0.9-1.59)	>0.05	0.83 (0.63-1.11)	>0.05
Self-perceived health				
Very bad	1		1	
Very good	1.01 (0.22-4.63)	>0.05	0.99 (0.22-4.58)	>0.05
Good	0.8 (0.18-3.58)	>0.05	1.25 (0.28-5.59)	>0.05
Fair	0.97 (0.22-4.31)	>0.05	1.03 (0.23-4.6)	>0.05
Bad	1.31 (0.28-6.22)	>0.05	0.76 (0.16-3.62)	>0.05
Chronic disease status				
No	1		1	
Yes	1.2 (0.89-1.62)	>0.05	0.83 (0.62-1.12)	>0.05
Visit a specialist				
Never	1		1	
In the past 12 months	1.25 (0.77-2.03)	>0.05	0.8 (0.49-1.29)	>0.05
After 12 months and more	0.98 (0.62-1.55)	>0.05	1.02 (0.65-1.620	>0.05
Sick leave				
No	1		1	
Yes	1.06 (0.77-1.45)	>0.05	0.95 (0.69-1.29)	>0.05

CONCLUSION

For the past few years, an increase in the number of OTC products on the market and the need for them could be noticed in Serbia. Highly educated and rich people most often, voluntarily and with the advice of pharmacist buy OTC

drugs for self-medication, while poor and less educated people more often buy OTC drugs for boosting the immune system which doctors do not issue prescriptions for. These findings are of paramount importance to both the health care policy creators and to OTC drug vendors which are doing business on the territory of the Republic of Serbia.

LIST OF ABBREVIATIONS

OTC	=	Over-the-counter drugs

ETHICAL APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

ANIMAL AND HUMAN RIGHT

Not applicable.

CONSENT FOR PUBLICATION

For the purpose of this study, data obtained through the National research on health condition of the population in the Republic of Serbia in 2013 was used.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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