

GENERAL

ANALYSIS OF THE FACTORS INFLUENCING CONSUMER BEHAVIOR IN CHOOSING OF OTC MEDICINES

PETKOVIĆ STAŠA^{1*}, MILOVANOVIĆ OLIVERA², DRAGUTINOVIĆ NINOSLAVA³,
DJURIĆ SONJA⁴, PAVLOVIĆ RADIŠA², RAVIĆ MARKO², KOSTIĆ MARINA⁵,
PETROVIĆ MARKO⁶, TOMOVIĆ MARINA² and DJURIĆ DUŠAN²

¹Hemofarm, Republic of Serbia

²Department of Pharmacy, Faculty of Medical Sciences, University of Kragujevac, Serbia

³Faculty of Health and Business studies, Singidunum University, Belgrade, Republic of Serbia

⁴Gentext Research Group, University of Valencia, Spain

⁵Department of Pharmacology and Toxicology

Faculty of Medical Sciences, University of Kragujevac, Serbia

⁶Department of Surgery, Faculty of Medical Sciences, University of Kragujevac, Serbia

Abstract: The COVID-19 pandemic, the burden on the health system, and reduced access to health services have led to an increase in the purchase of over-the-counter (OTC) medicines. The research was conducted in the Benu pharmacy in Belgrade, with 200 users of pharmacy services. The questionnaire for patients through 25 questions grouped into 5 dimensions provided an overview of the influence of various factors on the decision to purchase OTC medicines: the price of a medical examination, pharmacist recommendations, the influence of family and friends, previous experiences, and advertising. The analysis revealed a statistically significant difference between the scores in the claims of the respondents before and during the COVID-19 pandemic in the domains: the price of a medical examination ($t = 2.592$; $df = 198$; $p < 0.05$) and information on OTC medicines ($t = 2.549$; $df = 198$; $p < 0.05$). The Questionnaire for patients defines the factors that influence the choice of OTC medicines for the self-medication process and is a good guideline for considering the shortcomings in the trade of OTC medicines.

Keywords: OTC medicines, questionnaire, pandemic, COVID-19, self-medication

OTC medicines (non-prescription medicines) are medicines that are sold directly to the consumer without a prescription issued by a doctor (1). The large, uncontrolled consumption of OTC medicines indicates the need to strike a balance between dispensing OTC medicines and risk management during the self-medication process (2).

At the base of the health system pyramid is self-medication as a process that requires a high level of awareness, knowledge, and general education of people. Access to information, quality of information, as well as skills in interpreting and applying information about OTC medicines are important to support the self-medication process (3). The World Health Organization (WHO) emphasizes the responsibility of individuals for their own health, professionalism, and the level of awareness of pharmacists in the newly changed circumstances of dispensing OTC medicines (4).

In order to use OTC medicines safely and effectively, the consumer must recognize the symptoms,

set a therapeutic goal, choose the product to use, determine the appropriate dose and dosage, taking into account contraindications, associated diseases, and drugs that are part of his therapy for chronic problems, as well as monitoring the response to treatment while recognizing possible adverse effects (5, 6). These requirements, unfortunately, can only be met by a small number of OTC medicines users, making the efficacy and safety of their use uncertain, often risky, and can end in hospitalization. Procurement and use of OTC medicines without a doctor's recommendation poses a risk to the user but also to public health (7, 8).

Self-medication carries a serious risk of drug interactions, polypharmacy, misdiagnosis or drug dosing, prolonged drug use, improper drug selection, adverse events, addiction or abuse, and increased antimicrobial resistance (9, 10).

The COVID-19 pandemic is a major challenge for pharmaceutical practice. During the conditions of the pandemic, the supply and consumption of OTC

* Corresponding author: e-mail: stasa.petkovic@yahoo.com

medicines, primarily antipyretics, nasal and pharyngeal toilet preparations, vitamins, and other preparations for raising the immune status, increased significantly. Fear of infection and a fatal outcome to health led people of all ages to independently purchase and consume OTC medicines both for prevention and in the process of self-medication. Advertisements for OTC medicines are often a key factor in the patient's choice of medicine. Promotional messages through the media emphasize the product brand and lead consumers to purchase OTC medicines (11, 12). If the advertisements are wrong, patients can be misinformed because they focus on the basic effects of the drugs, without information about contraindications and warning measures.

Various studies have shown that self-medication with OTC medicines is a common practice, with a prevalence of 32.5-81.5% worldwide(13). The uncontrolled use of OTC medicines is a global problem affecting developed and developing countries(14). The COVID-19 pandemic, a large number of patients (15) as well as the uncontrolled spread of the virus, led people to procure OTC medicines in a panic following the recommendations of social media, without establishing their safety and effectiveness (16).

An uncontrolled process of self-medication with OTC medicines during the COVID-19 pandemic can worsen the health condition, requiring hospitalization that is burdensome for already overloaded health systems. The COVID -19 pandemic, during which the self-medication process was significantly more prevalent, indicated the need to establish an appropriate strategy to control the use of OTC medicines (17). Information from health professionals through the mass media should lead to rising consumer awareness about the proper and controlled use of OTC medicines (18).

Research on the factors influencing the selection, procurement, and use of OTC medicines, and their improper or uncontrolled use in Serbia is very scarce, so there are no guidelines for proper pharmaceutical practice. Also, there is a lack of research tools that would enable the identification of factors influencing the choice of OTC medicines by patients, so that the evaluation of results can see the shortcomings and propose guidelines for establishing new methods of pharmaceutical practice. The aim of this study is to point out the significant factors influencing the choice and procurement of OTC medicines for the self-medication process, with reference to the period of normal life before the pandemic and during the COVID-19 pandemic.

METHOD

The study represents quantitative, non-experimental research that was conducted in order to find

out about the factors influencing patients' decision to purchase OTC medicines in the self-medication process. A retrospective of the time-trend analysis on the procurement of OTC medicines was performed in the period before and during the pandemic in order to gain insight into the factors that influenced the consumers' decision on the procurement and use of medicines. For the purposes of this research, in the first months of the pandemic, on the territory of Belgrade, a cross-sectional study was conducted with the aim of examining attitudes and behavior related to the procurement of OTC medicines. The results of the questionnaire provide answers to questions about the factors that affect the purchase of OTC medicines by consumers and the attitude and perception of respondents about the risks of uncontrolled use. In the following text, conclusions are presented regarding the behavior of a group of Belgrade citizens and their motives for the purchase and use of OTC medicines. Based on the answers received from the citizens of Belgrade, it is not possible to draw conclusions about the general population in the entire country. Differences in socio-economic characteristics certainly affect knowledge and attitudes, as well as the self-treatment procedure itself, so similar research should be conducted in other parts of the country in order to fully understand the situation in Serbia.

After the translation and cultural adaptation of the Questionnaire, a SEM model was developed in order to analyze the internal agreement on questions of the questionnaire related to patients' attitudes about the purchase and use of OTC medicines. The structural model (SEM) presents a model of the influence (Figure 1) of individual predictors on the domain of outcome - the patient's decision on the choice and procurement of OTC medicines. The correlation model of domain attitudes, and in relation to the outcome, shows satisfactory characteristics (RMSEA = 0.092 (0.079-0.105); CFI = 0.819) which means that the Questionnaire met the criteria of a good research tool.

We analyzed the internal agreement on the issues related to patients' attitudes about the purchase and use of OTC medicines by calculating Cronbach's alpha coefficient. Questionnaire domains were found to have a good internal agreement of the questions because the values for Cronbach's alpha are greater than 0.7 (Table 1). The contents of the questionnaire proved valid and reliable, with a high enough degree (19) of internal consistency.

Study sample

Respondents were users of pharmacy services, selected on the basis of probability (random sample) and the sample size was determined based on the

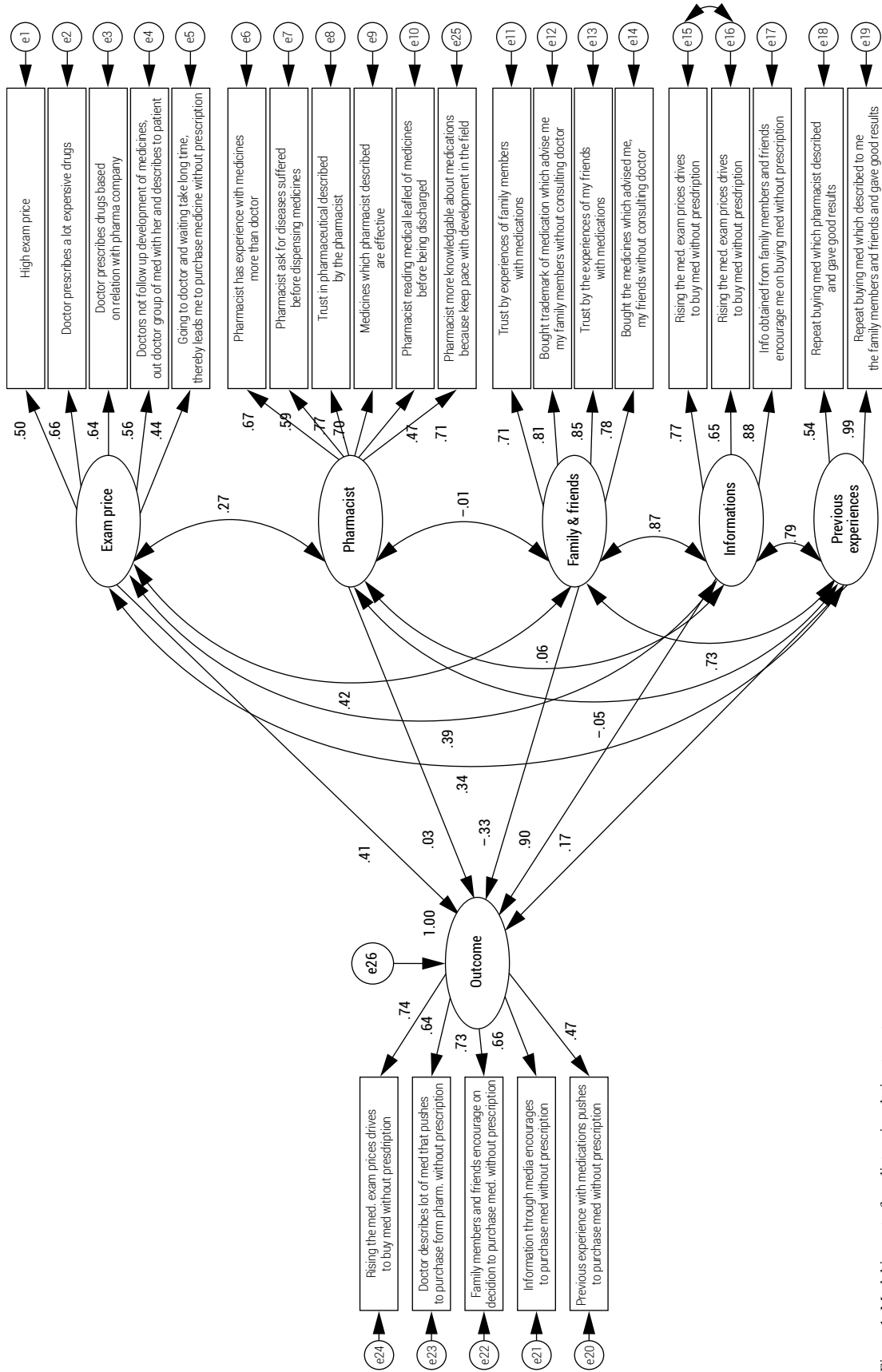


Figure 1. Model impact of predictors in relation to outcome.

Table 1. Analysis of the internal compliance of the questionnaire domain.

Questionnaire domains	N	Cronbach's alpha
The influence of the price of a medical examination on the decision of individuals for the purchase of OTC medicines	5	0.677
The influence of pharmacists on the decision of individuals on the purchase of OTC medicines	6	0.705
The influence of family and friends on the decision of individuals on the purchase of OTC medicine	4	0.857
The influence of information on the decision of individuals on the purchase of OTC medicines	3	0.782
The influence of previous experiences on the decision of individuals on the purchase of OTC medicines	2	0.705
Dependent variables	5	0.710

formula for calculating the sample size incorporated in the software package G * Power 3. The study included 200 respondents, 100 respondents in the pre-pandemic group, and 100 respondents during the pandemic period.

In relation to the sex of the respondents, there were 43% men and 57% women, before and during the pandemic. In relation to the age of the respondents, in the group of respondents before the pandemic, there were 33% of respondents up to 34 years, 36% of respondents from 34 to 49 years, and 31% of respondents over 49 years. The group of respondents during the pandemic was 31% under the age of 34, 35% between the ages of 34 and 49, and 34% over the age of 49.

In relation to the level of education, in the group of respondents before the pandemic, there were 61% with higher education and in the group of respondents during the pandemic, there were 66%. The criterion for exclusion from the study was the inability of the respondents to fill in the questionnaire on their own (visual impairment, motor skills, illiteracy). The respondents filled in the questionnaire on a tablet which enabled good visibility and the optimal time required to give an answer was 5-7 minutes. Each respondent gave their consent to participate in the study in writing, and by encrypting the completed questionnaire, the anonymity of the respondent was achieved, as well as the protection of personal data.

Procedures

Research on the factors influencing the selection and procurement of OTC medicines by patients before and during the COVID-19 pandemic was conducted at the Health Institution pharmacy Benu in Belgrade, in the period from September to November 2019th and from April to May 2020th and it was approved by Ethics Committee of this institution.

Instruments and data analysis

The research used the Patient Questionnaire by Rudain Othman Yousif (19) in the Department of Marketing, Faculty of Economic and Administrative Science, Al-Zarqa University of Jordan. The author of the questionnaire gave consent, the questionnaire was translated into Serbian, adapted to our speaking area (according to the given criteria and the standard procedure of translation and adaptation (20)), and used in further research. The 25 questions of the questionnaire are grouped into 5 dimensions and include the influence of several factors that influence consumers' decision to purchase OTC medicines: the price of a medical examination, pharmacist's recommendation, family and friends' recommendations, advertising, and the influence of previous personal experiences.

Using the Likert five-point scale, the respondents expressed the degree of their agreement for each individual statement as: "absolutely agree" (100%), "partially agree" (75%), "agree" and "disagree" (50%), "partially disagree" (25%), "absolutely disagree" (0%). Each answer of the respondents was scored in a determined way, i.e. from 1 to 5, and by adding points for each statement, a total score was obtained which expresses the attitude of the respondents, to a certain extent positive or negative for each of the statements in the domain. The Likert scale assumes that the intensity of attitude / opinion is linear. The scale values obtained on the Likert scale had a distribution that did not deviate from the normal distribution and were analyzed by parametric tests.

Results are represented by numbers (%), mean \pm standard deviation or median (25th-75th Percentile) depending on data type and distribution. The groups were compared using the parametric (t-test for independent samples) test. The structural model enabled the analysis of the internal agreement of the questionnaire domains related to patients' attitudes about the purchase and use of OTC medicines. The

model created latent variables (five new dimensions), and they were further correlated with the outcome, which is also a latent variable. All p values less than 0.05 were considered significant. All data were analyzed using SPSS 20.0 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) and R 3.4.2. (R Core Team) (2017).

RESULTS

Factors influencing the patient's decision to procure OTC medicines before and during the COVID 19 pandemic are presented by the average middle values of the responses of respondents in both groups across the five domains of the Questionnaire (Table 2).

Using the t-test for independent samples (Table 3) the analysis of respondents' attitudes about the factors that influenced their decision to purchase OTC medicines was performed and a statistically significant difference was observed in patients' attitudes toward the domain impact of the price of medical examination ($t = 2.592$; $df = 198$; $p < 0.05$), as well as the domain of the influence of information on the decision of individuals to purchase over-the-counter medicines

($t = 2.549$; $df = 198$; $p < 0.05$). The pandemic changed the functioning of the state health care system in the Republic of Serbia so that a large percentage of patients had to seek health services in private health care institutions. The high cost of the medical examination influenced their decision to procure OTC medicines in order to start the process of self-medication with as little financial expense as possible.

Table 4 shows the changes in middle values of the score before and during the pandemic for claims of domains where statistical significance was observed: the impact of the cost of medical examination and the impact of information on the decision to procure OTC medicines. It was noted that the high prices of medical examinations, long waits with doctors, and information about OTC medicines from the media significantly influenced the decision of patients to purchase OTC medicines more often during the pandemic.

The analysis of the attitudes of the respondents before and during the pandemic in relation to the gender and age of the respondents did not show a statistically significant difference. Statistical significance for the domain was observed using the t-test for independent samples. Influence of the price of

Table 2. Average values of respondents' answers by domains.

Questionnaire domains	Before pandemic		During pandemic	
	M	SD	M	SD
The influence of the price of a medical examination on the decision of individuals for the purchase of OTC medicines	2.68	0.63	2.87	0.38
The influence of pharmacists on the decision of individuals on the purchase of OTC medicines	2.33	0.61	2.28	0.50
The influence of family and friends on the decision of individuals on the purchase of OTC medicine	1.96	0.90	2.06	0.95
The influence of information on the decision of individuals on the purchase of OTC medicines	1.53	0.92	1.88	1.00
The influence of previous experiences on the decision of individuals on the purchase of OTC medicines	2.72	0.84	2.70	0.83

Table 3. Overview of factors influencing the selection of OTC medicines.

Questionnaire domains	t	df	p
The influence of the price of a medical examination on the decision of individuals for the purchase of OTC medicines	2.592	198	0.010
The influence of pharmacists on the decision of individuals on the purchase of OTC medicines	0.735	198	0.463
The influence of family and friends on the decision of individuals on the purchase of OTC medicine	0.764	198	0.446
The influence of information on the decision of individuals on the purchase of OTC medicines	2.549	198	0.012
The influence of previous experiences on the decision of individuals on the purchase of OTC medicines	0.253	198	0.800

Table 4. Average values of respondents' responses to claims of domains with defined impact.

	Before pandemic		During pandemic	
	M	SD	M	SD
The influence of the price of a medical examination on the decision of individuals for the purchase of OTC medicines				
The prices of medical examinations are high	2.55	0.86	3.09	0.51
The doctor prescribes a lot of medicines and their prices are high	2.45	1.02	1.91	0.73
Many doctors prescribe medicines based on their relationship with sales representatives	3.11	0.84	3.22	0.63
Doctors do not monitor the development of medicines, but each doctor has a group of medicines that he recommends to patients	2.64	0.94	3.05	0.72
Going to the doctor and waiting takes a lot of time, which leads me to buy medicine without a prescription	2.67	1.06	3.10	0.78
The influence of information on the decision of individuals on the purchase of OTC medicines				
I bought OTC medicines based on information published in the media	1.40	1.04	2.28	1.45
I rely on promotional activities carried out by manufacturers in the medicine market	1.35	1.01	1.29	0.99
Information from family members and friends encourages me to buy OTC medicines	1.84	1.09	2.06	1.17

medical examination on the decision of individuals to buy over-the-counter medicines before the pandemic ($t = 2.737$; $df = 98$; $p = 0.007$) among respondents without a university education, while during the pandemic no statistically significant difference was observed between the attitudes of both groups. For the domain of influence of family and friends on the decision of individuals to purchase over-the-counter medicines, before the pandemic ($t = 1.989$; $df = 98$; $p = 0.049$) as well as during the pandemic ($t = 2.146$; $df = 98$; $p = 0.034$) was observed statistical significance as well as the greater impact of information obtained from family and friends among respondents with a university degree.

The study noted that during the COVID-19 pandemic, patients most often bought antipyretics (100%), analgesics (99%), decongestants (82%), and antitussives (66%), while the presence of other OTC medicines (antihistamines, laxatives, stimulants...) was less than 50%. In order for patients to choose the offered medicine for each group, they were given the possibility to choose according to the commercial name of the medicine (registered protected name of the medicine).

Analyzing the factors influencing the procurement of OTC medicines before and during the pandemic, we concluded that the domain of information about OTC medicines and the cost of medical examinations significantly influence patients' decision to purchase medicines, while the influence of family and friends, previous experiences and pharmacists are irrelevant for procurement of OTC medicines in subjects of both groups.

DISCUSSION

The evaluation of the research results shows the factors influencing the choice and decision on the procurement of OTC medicines by the respondents, which is significant especially in extraordinary circumstances such as the COVID-19 pandemic. In the prevention and treatment of COVID-19, the WHO does not recommend self-medication with OTC medicines (21). The very mystery of the COVID-19 virus, fear of infection, inability to see a doctor (22), stigmatization of people infected with COVID-19 in isolation (23) as well as advertising of OTC medicines have influenced the increase in sales of OTC medicines, uncontrolled use and the accumulation of medicine reserves.

The COVID-19 pandemic brought fear and uncertainty into people's lives, especially the lack of guidelines for protection, the uncertainty of treating covid infections, the knowledge of a large number of hospitalized, and the number of people on respirators and deceased. They influenced the increased supply of OTC medicines, both in order to reduce mild problems and in terms of prevention. Prohibition of movement and impossibility of social contacts, loneliness, and information on the number of infected people has led to uncontrolled procurement of OTC medicines. Intensifying awareness-raising campaigns is crucial to combating misinformation about alleged COVID-19 prevention products on social media. Self-medication was identified in 48% of patients during lockdown (quarantine) and 15% before lockdown

(24). The percentage change in the sales value of health products of OTC medicines due to coronavirus (COVID-19) in Italy in the period from March to May 2020th increased from 30% to 217.4% according to the report of the Statistician Research Department (25). Following the views of our respondents, we can assume that at the time of the pandemic due to a lack of information about the infection and the nature of the COVID-19 virus and unclear professional guidelines, respondents changed their attitude regarding OTC medicines. They are more careful when procuring OTC medicines, they have less trust in recommendations from friends and pharmacists, and because of the fear and uncertainty that this pandemic has brought, they do not even believe in their positive experiences with previously used OTC medicines. However, isolation and quarantine have influenced people to spend a lot of time in front of the TV and on social networks whose content is filled with advertising messages about OTC medicines, which has influenced our respondents, directed them, and led them to purchase OTC medicines. Primarily, they can be a relevant source of accurate and reliable information to the public or other healthcare professionals, thus reducing the spread of misinformation about COVID-19 prevention drugs. This can be achieved by providing accurate and reliable information based on the recommendations of relevant health authorities and professional associations to ensure that the community understands the importance of the message and thus minimizes the harmful consequences of a pandemic.

Since the beginning of the pandemic in Serbia, all health care institutions have been operating in the COVID regime, which has included increased protection measures against infection and a reduction in the admission of non-emergency patients. The registered reduced volume of services provided by the Adult Health Care Service has primarily had a negative impact on the control of the health status of chronic patients, who make more visits to the doctors during the year compared to the general population. According to the AmCham COVID study, the number of first examinations in health clinics is 45% lower compared to the same period in 2019th, the number of control examinations was lower by 44.6% (26).

The burden on the health system and waiting for several hours at the doctor's due to acute problems, led people to seek help in private health institutions. At the same time, it meant a financial burden for them, so many of them procured OTC medicines for self-treatment on their own.

The uncertainty of the pandemic, the large number of patients, and the isolation of people influenced the mass appearance of advertisements on social

networks, but also on television, both OTC medicines and various medical equipment (pulse oximeters, oxygen concentrators...).

All-day reporting on the number of patients, the number of people on respirators, and the number of deaths contributed to the appearance of fear and panic among citizens, and OTC medicines ads were an alternative to maintaining health. It was their mass procurement and use that became a danger due to polypharmacy and side effects. Our respondents were also susceptible to media advertisements believing in the reliability and accuracy of the information. The large crowds in pharmacies made it impossible for them to consult with pharmacists, so they mostly made their own decisions about how to self-medicate.

Since the beginning of the COVID-19 pandemic, online pharmacies have become a serious public health problem because they offer the sale of medicines directly to customers via the Internet. Consumers are increasingly using the Internet not only to find out information about their health but also to conduct self-diagnosis and buy health products, where the reliability of information is not checked because the COVID-19 pandemic causes global panic as a health shock (27).

Given that pharmacists are considered to be highly professional staff in the health system of each country, it is inadmissible that current events shake confidence in their expertise. On the contrary, in the absence of the possibility to perform medical and consultative examinations, people get the opportunity to consult pharmacists and receive reliable information. In the multitude of information and misinformation that are placed through various media, pharmacists have a significant role in protecting the health of people who panic looking for appropriate ways to protect themselves from the virus. Procurement of a large number of OTC medicines and self-medication conditioned by fear and a burdened health system can produce a health crisis that would lead to the collapse of the health system. Pharmacists have an important task, on the first line of defense, to direct the therapy of patients, and channel the process of self-medication by supervising and monitoring the side effects of OTC medicines used in the prevention and treatment of COVID-19.

In our speaking area, there was no research on the factors that influence the selection and procurement of OTC medicines, in order to assess the risk to which patients are exposed in the process of self-medication. By applying the questionnaire and evaluating the research results, significant factors can be identified that affect the safety of the self-medication process, which in the conditions of a pandemic sets

new requirements for better and more comprehensive pharmaceutical practice.

CONCLUSION

Self-medication during the COVID-19 pandemic is exposed to numerous risks, so it is necessary to identify the factors that influence the decision to purchase and use OTC medicines by patients.

The questionnaire for the patient, as a reliable research instrument, enabled the assessment of factors influencing the selection and procurement of over-the-counter medicines, with reference to the period of normal life before the pandemic and during the COVID-19 pandemic.

The research noted a lack of trust in pharmacists, previous good experiences with drugs as well as family and friends. Increased caution, unfortunately, does not refer to the influence of the media and advertising of OTC medicines, which is especially important in extraordinary epidemiological circumstances for the trade of OTC medicines.

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Conflicts of interest

The authors declare that no conflicts of interest exist.

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