Research Article

Results of the assessment of the level of literacy of the Ukrainian population in matters of health and use of medicines

Elizaveta Kovtun[1], Alina Volkova[1]

1 *National University of Pharmacy, Kharkiv, Ukraine*

Corresponding author: Elizaveta Kovtun (lizaveta199916@gmail.com)

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Abstract

An instrument for assessing the health literacy of the population in matters of health and use of medicines was developed and a survey was conducted among different age groups of the Ukrainian population. Based on the analysis of the data obtained, it is proved that health literacy and pharmaceutical literacy in particular are an important factor in shaping health outcomes and quality patient interaction with doctors and pharmacists. The data obtained at this stage emphasize the need to improve the level of health and pharmaceutical literacy of the population, taking into account the needs, basic knowledge and skills of each age group. The study also demonstrates the relevance of regular assessment of the population's awareness of health issues and the use of medicines in order to understand how each component of health literacy may differ between the identified age subgroups (e.g., adolescents, the elderly), with further development of adapted approaches to forming an appropriate level of knowledge on health issues and rational use of medicines and the specifics of their use for different segments of the population.

Keywords

Introduction

As defined by Pulio and her colleagues, patients' health literacy is the ability to obtain, process, understand, and apply health information and services to make appropriate decisions about their own health (Palumbo et al. 2019). A wide range of skills are part of health literacy, including reading, listening, understanding, calculating, analyzing, and making personal decisions about one's health (Khaleel et al. 2020). Over the past 10 years, the topic of health literacy has been gaining more and more attention as a concept for improving people's health and increasing the efficiency of health systems in general. In addition, scientists from many countries are increasingly paying attention to this concept in the context of the use of medicines and highlighting its component – medication literacy (pharmacotherapy literacy). Today, medication literacy is defined as the level of ability of a particular person to receive, understand, communicate, compute and understand information about medicines and pharmaceutical services in order to make informed decisions about medicines and health for safe and effective use of medicines, regardless of the way the content is received (written, oral or visual) (King et al. 2011; Náfrádi et al. 2019; Khaleel et al. 2020).

According to public health and health care experts, it is necessary to study the level of medical and pharmaceu-

tical literacy of the population to develop effective measures to improve public health. For this purpose, experts from around the world have developed and tested various methods for assessing the level of medical and medication literacy, according to which national studies have been conducted. Studies show that patients with a low level of knowledge about health and the use of medicines are less likely to adhere to the prescribed treatment and medical instructions of their doctor, which, accordingly, leads to irrational consumption of medicines, causes the development of chronic pathological conditions, negative consequences for public health, and increased health care costs (Weiss 2018; Vamos et al. 2020). Timely identification of patients at risk of low health literacy and medication use allows healthcare and pharmaceutical professionals to use specific, clear communication methods to improve understanding of the necessary medical and pharmaceutical information (Vamos et al. 2020).

As the pharmaceutical market environment and the pharmaceutical information available on it is constantly changing, continuing to evolve and becoming more complex, determining the level of medication literacy can improve the safety of medication use, help to increase the quality of responsible self-medication and bring patient-pharmacist collaboration to a new level. Moreover, low literacy levels lead to economic and health costs, and an obvious solution to limit or reduce these costs is to increase literacy levels, as is achieved with health literacy.

According to the results of the preliminary analysis, it was determined that today more than 10 tests are recommended for use in the world to measure the health literacy of the population, and medication literacy in particular. For example, within the framework of the European project "Health Literacy", a study of health literacy was conducted using the REALM (Rapid Estimate of Adult Literacy in Medicine) and TOFHLA (Test of Functional Health Literacy in Adults) tests (Pouliot et al. 2018). The main indicator of literacy in these tests is the understanding of medical texts and doctor's instructions for taking medications. The shortest test is NVS (New Vital Sign), which consists of three questions. Such tests as Health Literacy Survey – Europe (HLS-EU), Health Education Impact Questionnaire (heiQ), Health Literacy Questionnaire are effective tools for assessing the understanding of health information (Weiss 2018; Pelikan et al. 2019). For the first time, a tool for assessing the pharmaceutical literacy of the population was developed and used in 2012 in the United States – it was the MedLitRxSE (Medication Literacy Assessment in Spanish & English) test. In 2018, the Netherlands developed the RALPH (The Recognition and Addressing of Limited Pharmaceutical Literacy) questionnaire. And in 2020–2021 the MELIA (Medication Literacy Assessment) tool was used in Switzerland (Sauceda et al. 2012; Pouliot et al. 2018; Náfrádi et al. 2019). The questions of these tests relate directly to the use of prescription and over-the-counter medicines, understanding and adherence to the instructions, the dosage regimen and duration of treatment, and assessment of the ability to determine the dose.

Accordingly, the aim of our study was to develop a questionnaire and determine the level of awareness of the population in Ukraine on health issues and medicines use, taking into account the respondents' belonging to a certain age group, peculiarities of self-assessment of health status, and experience of using medicines.

Materials and methods

The design of the study envisaged conducting a survey based on a questionnaire developed by the authors among the population of Ukraine on the Internet from August 2021 to October 2021. To calculate the sample size of respondents, the Raosoft online sample size calculator was used. According to statistics on the country's population as of August 1, 2021, the minimum required sample size was 385 participants with a 95 percent confidence level and a 5 percent margin of error.

Based on the results of the literature review (Institute of Medicine 2004; Powers et al. 2010; Sauceda et al. 2012; Nutbeam et al. 2018; Náfrádi et al. 2019; Israa et al. 2020; Volkova and Kovtun 2021), pre-tested questions were adapted based on available information on global experience in measuring health literacy and medicines use among the population of individual countries according to the REALM, NVS, HLSI, TOFHLA, and RALPH methodologies (Murphy et al. 1993; Powers et al. 2010; Sauceda et al. 2012; Nutbeam et al. 2018; Náfrádi et al. 2019; Palumbo et al. 2019; Israa et al. 2020; Pantuzza et al. 2022).

The survey was conducted using a Google form, the link to which was posted on Facebook and Instagram. The questionnaire provided for independent anonymous answers to questions, before which the purpose of the study was explained. The survey was voluntary.

The specially developed questionnaire consisted of 30 questions grouped into blocks: socio-demographic characteristics, self-assessment of health, ability to find, understand and analyze information about medicines, and understanding of the concept of health literacy (Fig. 1).
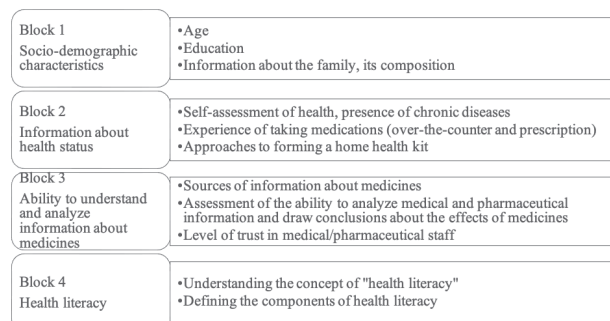

Figure 1. Structure of the questionnaire developed by the authors.

The results of the study were processed using Google Sheets and MS Excel, using the methods of statistical, logical, comparative, graphical analysis, and generalization.

Results and discussion

A total of 1492 respondents took part in the survey over the course of 3 months. In order to analyze the influence of a person's age on their attitude to their own health and to determine trends in the age groups of respondents separately, we chose the theory of generations to group the answers of respondents. According to the analysis of the responses, the vast majority of respondents were born in the period 1984–2000 (39% of all respondents) and the smallest part of respondents are representatives of the "silent" and "baby boomer" generations (11% of respondents). The general characteristics of the survey participants according to their years of birth are shown in Table 1. Since Generation Z also includes people who were under the age of majority at the time of the survey, we excluded the answers of those under 18.

It is a well-known fact that the level of education influences a person's behavior, lifestyle, and habits. Education is the most effective way to improve medication literacy, since the more educated the population as a whole is, the more likely it is to have a basic understanding of medical and pharmaceutical terms, practice disease prevention, prevent the spread of misinformation about diagnosis and treatment, practice responsible self-medication and rational consumption of medicines. The results of determining the level of education of the survey participants showed that the majority of respondents have higher education, namely 80.4% of men and 83.9% of women. In general, the majority of respondents, namely 84% of those surveyed, have higher education, 9% have secondary education, and 7% have specialized secondary education (Table 2).

The next block included questions about respondents' self-assessment of their health. The analysis of the responses revealed that the majority of respondents assessed their health as "good" – 73.4% of respondents, while 0.5% of respondents rated it as "very poor". Thus, representatives of Generation Y rated their health condition higher, with 123 respondents from this age group giving it a "very good" rating.

We also analyzed the presence of chronic diseases among respondents depending on their age group and found that Generation X representatives reported having chronic diseases more often than others, namely, 332 respondents have chronic diseases. As for Generation Z representatives, 15 respondents rated their health as "excellent", 44 respondents as "very good", and 116 respondents as "good", while 23 Generation Y representatives rated their health as "excellent", 123 respondents as "very good", and 411 respondents as "good". As for the presence of chronic diseases, 37.6% of all respondents do not have any (Table 3).

The results obtained in answers to the question about the use of medications by the population show that the choice of medications for home medicine cabinet is mainly caused by acute symptomatic diseases (35%) and seasonal diseases (31%). Also noteworthy is the fact that the vast majority of respondents said they had no experience using prescription drugs (53.41%), but the share of those with chronic diseases (52.88%) is also very high. Another concern is that respondents with chronic diseases rarely visit a doctor. Given that most chronic diseases are treated with prescription drugs, it can be argued that the population lacks knowledge about the categories of drugs and the imperfection of the national prescription system.

It was determined that most often home first-aid kit of respondents are formed to treat acute symptoms of diseases (34.6% of answers) and to treat seasonal diseases (31.4% of answers), respectively, they contain medicines from the following groups: drugs for the treatment of throat diseases (77.1% of answers), analgesics (76.9% of answers) and drugs for the treatment of functional disorders of the gastrointestinal tract (60.7% of answers) (Fig. 2). The vast majority of medications in these groups are OTC, so anyone can buy them at a pharmacy and get a pharmacist's advice when they are dispensed, but in such

Table 1. Characteristics of the sample of respondents.

Name of the generation	Years of birth	Age at the time of the survey	Numbers, % in the group		% in the total number of respondents
			men	women	
Silent	1925–1945	76–96 years	50	50	0.13
Baby boomers	1946–1964	55–77 years	94.9	5.1	10.53
Generation X	1965–1982	39–56 years	93.7	6.3	37.33
Generation Y	1983–1996	25–38 years	88.3	11.7	39.209
Generation Z	1997–2012	18–24 years	84.2	15.8	12.801

Table 2. Distribution of respondents by level of education in age groups.

Level of education	Generation											
	Silent		Baby boomers		Generation X		Generation Y		Generation Z		Total number of respondents	
	women	men	women	men	women	men	women	men	women	men	number	%
higher education	1	–	138	8	507	35	428	58	58	14	1247	83.58
secondary education	–	–	1	–	–	–	23	2	97	13	136	9.12
secondary specialized education	–	1	10	–	15	–	66	8	5	4	109	7.3

Table 3. Results of self-assessment of health in different age groups.

Result	Generation					Total number of respondents	
	Silent	Baby boomers	Generation X	Generation Y	Generation Z	number	%
Health self-analysis							
excellent	–	1 (2.3%)	5 (11.4%)	23 (52.3%)	15 (34%)	44	2.95
very good	–	2 (0.92%)	48 (22.12%)	123 (56.68%)	44 (20.28%)	217	14.5
well	–	125 (11.42%)	443 (40.46%)	411 (37.53%)	116 (10.59%)	1095	73.4
poorly	–	27 (20.93%)	58 (44.96%)	28 (21.71%)	16 (12.40%)	129	8.65
very badly	2 (28.57%)	2 (28.57%)	3 (42.86%)	–	–	7	0.5
Presence of chronic diseases							
yes	2 (0.25%)	120 (15.21%)	332 (42.08%)	261 (33.08%)	74 (9.38%)	789	52.88
no	–	24 (4.28%)	166 (29.59%)	272 (48.48%)	99 (17.65%)	561	37.6
don't know	–	13 (9.15%)	59 (41.55%)	52 (36.62%)	18 (12.68%)	142	9.52
Frequency of visits to the doctor							
rarely	2 (0.17%)	118 (10.17%)	445 (38.36%)	452 (38.97%)	143 (12.33%)	1160	78
often	–	29 (10.6%)	90 (32.97%)	109 (39.93%)	45 (16.5%)	273	18
always in touch	–	10 (17%)	22 (37.3%)	24 (40.7%)	3 (5%)	59	4

Table 4. Results of medications used by respondents.

Result	Generation					Total number of respondents	
	Silent	Baby boomers	Generation X	Generation Y	Generation Z	number	%
Availability of a home first aid kit							
yes	2 (0.1%)	154 (10.5%)	553 (37.7%)	571 (39%)	186 (12.7%)	1466	98
no	–	3 (11.5%)	4 (15.4%)	14 (53.9%)	5 (19.2%)	26	2
Factors influencing the choice of medicines for a home first aid kit							
chronic diseases	2 (0.53%)	70 (18.4%)	166 (43.7%)	104 (27.37%)	38 (10%)	380	25.5
acute symptoms of the disease	–	40 (7.74%)	175 (33.84%)	230 (44.49%)	72 (13.93%)	517	34.6
seasonal diseases	–	41 (8.8%)	166 (35.5%)	195 (41.7%)	66 (14%)	468	31.4
travelling	–	6 (5%)	50 (39%)	56 (44%)	15 (12%)	127	8.5
Experience with prescription medicines							
yes	2 (0.28%)	108 (15.53%)	235 (33.8%)	256 (36.83%)	94 (13.56%)	695	46.6
no	–	49 (6.15%)	322 (40.4%)	329 (41.28%)	97 (12.17%)	797	53.4

Table 5. Results of respondents' self-assessment of the use of information on medicinal products.

Result	Generation					Total number of respondents	
	Silent	Baby boomers	Generation X	Generation Y	Generation Z	number	%
Level of understanding of information about medicines by respondents							
easy	1 (0.1%)	133 (10.2%)	497 (38.2%)	507 (38.9%)	164 (12.6%)	1302	87.27
difficult	–	14 (18%)	27 (35%)	25 (32%)	12 (15%)	78	5.23
very easy	1 (0.9%)	10 (9%)	32 (28.8%)	53 (47.8%)	15 (13.5%)	111	7.44
very difficult	–	–	1 (100%)	–	–	1	0.06
Actions to be taken in case of side effects of the medicine							
I stop taking it and consult a doctor	1 (0.1%)	96 (11.9%)	341 (42%)	289 (356%)	83 (10%)	810	54.3
I see a doctor immediately	–	17 (7.2%)	66 (28%)	105 (44.5%)	48 (20.3%)	236	15.8
I go to the pharmacist immediately	–	–	2 (100%)	–	–	2	0.1
I seek advice from a doctor and pharmacist	–	1 (2.1%)	12 (25.5%)	27 (57.5%)	7 (14.9%)	47	3.2
I look for information on the Internet	–	24 (12.3%)	71 (36.41%)	80 (41.03%)	20 (10.26%)	195	13
I ask my friends for advice	–	1 (9%)	4 (36.4%)	4 (36.4%)	2 (18.2%)	11	0.8
I don't do anythings	1 (0.5%)	18 (9.4%)	61 (31.9%)	80 (42%)	31 (16.2%)	191	12.8

situations it is imperative to understand the importance of following these specialist recommendations.

The next set of questions included those that allowed us to determine the specifics of respondents' use of pharmaceutical information, analyzed how easy it is to find information about the medicines they need in clear terms for each respondent. It was found that 87.2% of all respondents said that it was easy for them to find information about medicines.
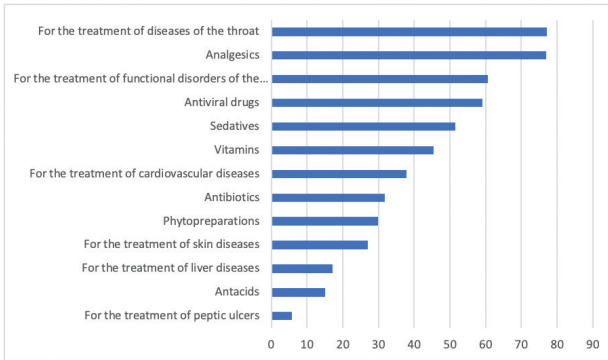
Figure 2. Groups of medicines included in the respondents' home first-aid kit.

Regarding the difficulty of finding information about needed medicines in clear words and from reliable sources, it was found that the number of respondents with higher education was highest among those who believe that such information is easy and very easy to find. Also noteworthy is the fact that none of the respondents reported finding clear and reliable information about medicines as very difficult, which is explained by the availability of open and trusted sources of information for the population (Fig. 3).
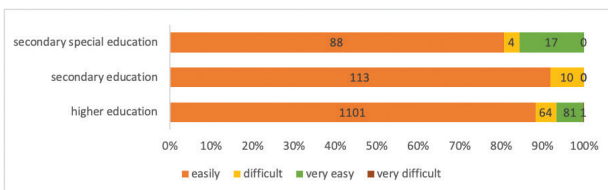
Figure 3. Ease of searching for reliable information about necessary medicines in understandable words for different groups of respondents by education level.

The next block of the questionnaire was devoted to questions that allowed us to determine the attitude of respondents to healthcare professionals – pharmacists and doctors. It was determined that the population trusts doctors more, as 1345 respondents, which is 90.14% of all responses, said so. In particular, 521 respondents of Generation Y (34.89% of all surveyed respondents) trust a doctor, and 64 respondents of the same generation (or 4.2% of all respondents) trust a pharmacist (Fig. 4). Regarding doctor's consultations, only 4% are constantly in touch with a doctor, 18.3% often consult, and 77.7% rarely consult a doctor. Only 4% of Generation Y representatives
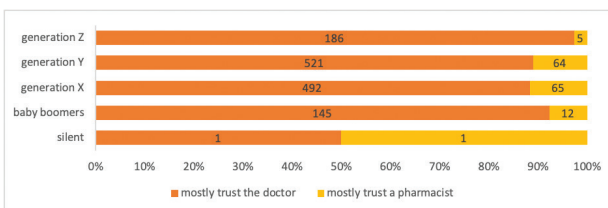

Figure 4. Results of the assessment of trust in healthcare professionals.

are constantly in touch with a doctor, 18.6% often consult a doctor, and the rest rarely consult a doctor.

The final set of questions was aimed at finding out how the respondents understood the concept of health literacy, its components, and impact on health. The results of the respondents' interpretation of the concept of health literacy showed that the majority associate it with knowledge about disease prevention (Fig. 5).
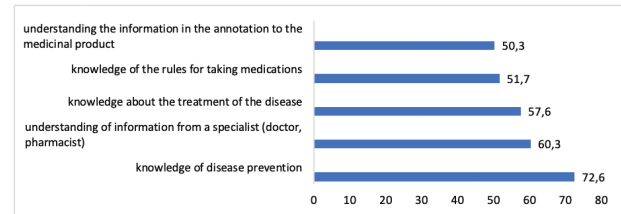

Figure 5. Understanding of health literacy by respondents.

When asked about the components of health literacy, the majority of respondents said that limited health literacy is related to low level of health knowledge (51.9%), while another share of respondents believes that limited health literacy is related to the lack of special training courses in educational institutions (27.2%) and low level of medical development (20.8%). According to the methods for assessing medical and medication literacy, their components include knowledge of the rules for taking and storing medicines, understanding of medical terms and instructions, and the ability to analyze and explain medical information (Murphy et al. 1993; Náfrádi et al. 2019; Plaza-Zamora et al. 2020; Volkova and Kovtun 2021).

Regarding health literacy components, respondents gave the following answers, shown in Fig. 6.
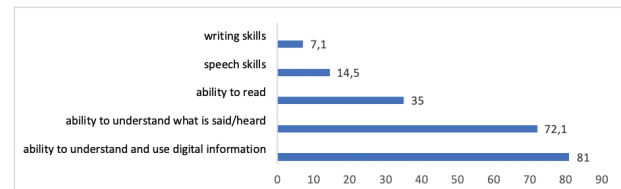

Figure 6. Health literacy components according to the respondents.

Thus, 81% of respondents believe that health literacy is the ability to understand and use digital information, and 72.1% interpret it as the ability to understand what healthcare professionals say.

Discussion of the study results

In the current conditions of widespread self-treatment among the population of Ukraine, physical availability of most medicines, it is critical that the population recognizes the importance of the role of pharmacists in minimizing the harmful effects of irrational consumption of medicines on public health. The world experience of involving pharmaceutical professionals in public education and provid-

ing additional pharmaceutical services in accordance with the specific requirements of patients and the epidemiological situation in the country has proven to be effective in improving the quality of life of patients and preventing serious consequences of diseases (Collum et al. 2013; Vervloet et al. 2018; Plaza-Zamora et al. 2020). And it is through pharmacists, as a link between the doctor and the patient in the use of medicines, that the development of health literacy and the use of medicines can be promoted.

Our study has revealed several facts about the level of health literacy in Ukraine.

Firstly, about 80% of respondents assess their health as "good", with the vast majority of women giving this assessment to Generation X representatives (87.3%) and Generation Y men (83.9%). It was also determined that the largest number of chronic diseases is observed among representatives of Generation X – 42.08%. Thus, it can be concluded that women's health is better than men's, and representatives of Generation Y and Generation Z have the best health indicators than representatives of other generations, which is primarily due to the age of these groups.

Secondly, the choice of medicines for the home medicine cabinet among respondents is mainly caused by acute conditions (34.6%) and seasonal diseases (31.4%).

Thirdly, people very rarely seek advice from healthcare professionals, and in general, they show more trust in doctors than pharmacists. Among all respondents, only 18% often consult a doctor, and 4% are always in touch. However, despite the fact that respondents trust doctors more, they rarely seek qualified help.

The overwhelming majority of respondents do not have any difficulties finding information about medicines (87.27%). Given the fact that among all generations surveyed, the largest number of respondents have higher education (83.58%), we can assume that there is a correlation between the level of education and the level of difficulty in finding and processing information about medicines. It should also be noted that in the period of active development and implementation of information technologies in everyday life and active use of the Internet to search for necessary information, it is important to ensure the quality and reliability of information in open sources, including information about medicines. Unfortunately, there are currently gaps in the national legislation regulating medical and pharmaceutical content on the Internet, which may affect the outcome of medicines used by the population, especially during self-medication.

When self-medication, it is important to be able to read instructions, to be able to search for the necessary information about medicines, and when receiving pharmaceutical care in a pharmacy, communication skills should be developed so that the patient can explain their symptoms and condition in general, or find out the specifics of using the medicines. Taking into account the answers to the questions about the concept of health literacy and its components, we can say that the respondents do not understand the importance of basic reading, comprehension, and communication skills in obtaining and using information about health and medicines. Also noteworthy is the dominance of the ability

to understand and use digital information as the main component of health literacy, which is explained by the current conditions of digitalization of all spheres of society. However, a prerequisite for working with digital information is the ability to correctly find and evaluate its relevance, reliability, and professionalism according to the request.

According to the survey, despite having chronic diseases, people use prescription drugs without a doctor's prescription and rarely seek medical advice. Another concern is the fact that almost a third of respondents, when experiencing side effects while taking medications, solve this problem on their own – they look for information on the Internet (13%) , turn to friends (0.8%) or do nothing at all (12.8%). Taking into account such data, we can talk about the relevance of developing the skills of the population to properly search, understand, realize and use available professional pharmaceutical information, i.e., the development of medication literacy. Accordingly, it is important to develop and implement programs to assess and raise awareness of the country's population on health issues and rational use of medicines, as well as to build the right relationship between healthcare professionals and patients. The first step is to develop a qualitative questionnaire to assess the level of awareness and ability to analyze medical and pharmaceutical information.

Conclusion

The results of this stage of the study of Ukrainian population's awareness of health issues and medicines use in particular show the influence of many factors on the level of literacy of the population, and thus the level of seriousness of their attitude to their own health. The population rarely seeks out qualified specialists, instead looking for information on how to improve their health on their own. According to the self-assessment, the level of medical and pharmaceutical literacy of the population is low.

In order to increase the level of health literacy and use of medicines, it is important to build effective relationships between patients, doctors and pharmacists, introduce methods for assessing the level of literacy in each age group and promote public awareness through health programs adapted to the needs of society in accordance with the age groups, basic level of education, knowledge and skills in the use of medicines, etc.

Accordingly, we believe that it is promising to continue work on developing tools for assessing the level of medication literacy of the population, identifying relevant and popular types of information about medicines and ways to obtain it in each age group of the country, as well as assessing effective ways to disseminate reliable information adapted to the needs of specific groups of the population according to age, level of education, health status and experience of using medicines. Such measures will form the basis for developing a model for conducting educational activities at various levels and campaigns aimed at promoting responsible self-medication and rational consumption of medicines by the country's population.

References

Collum J, Marcy T, Stevens E, Burns C, Miller M (2013) Exploring patient expectations for pharmacist-provided literacy-sensitive communication. Research in Social and Administrative Pharmacy 9(5): 626–632. https://doi.org/10.1016/j.sapharm.2012.05.012

Institute of Medicine (2004) Health Literacy: A Prescription to End Confusion. Washington, DC: The National Academies Press. https://doi.org/10.17226/10883

Israa K, Wimmer BC, Peterson GM, Zaidi STR, Roehrer E, Cummings E, Lee K (2020) Health information overload among health consumers: A scoping review. Patient Education and Counseling 103(1): 15–32. https://doi.org/10.1016/j.pec.2019.08.008

Kickbusch I, Pelikan JM, Apfel F, Tsouros AD (2014) Health literacy. The hard facts. World Health Organization. Regional Office for Europe. https://apps.who.int/iris/handle/10665/277124

King S, McCaffrey D, Bouldin A (2011) Health literacy in the pharmacy setting: defining pharmacotherapy literacy. Pharmacy Practice 9(4): 213–220. https://doi.org/10.4321/S1886-36552011000400006

Murphy PW, Davis TC, Long SW (1993) Rapid Estimate of Adult Literacy in Medicine (REALM): A Quick Reading Test for Patients International Literacy Association 2: 124–130.

Náfrádi L, Papp-Zipernovszky O, Schulz PJ, Csabai M (2019) Measuring functional health literacy in Hungary: Validation of S-TOFHLA and Chew screening questions. Central European Journal of Public Health 27(4): 320–325. https://doi.org/10.21101/cejph.a4885

Nutbeam D, McGill B, Premkumar P (2018) Improving health literacy in community populations: a review of progress. Health Promotion International 33(5): 901–911. https://doi.org/10.1093/heapro/dax015

Palumbo R, Annarumma C, Musella M, Adinolfi P (2019) A recipe for excellence in health care: investigating the relationship between health literacy, self-efficacy, awareness, and health services' use. Italian journal of management 107(36): 89–111. https://doi.org/10.7433/s107.2018.05

Pantuzza S, Nascimento E (2022) Medication literacy: A conceptual model. Research in Social and Administrative Pharmacy 18(4): 2675–2682. https://doi.org/10.1016/j.sapharm.2021.06.003

Pelikan J, Ganahl K, Van den Broucke S, Sørensen K (2019) Measuring health literacy in Europe: Introducing the European Health Literacy Survey Questionnaire (HLS-EU-Q). https://doi.org/10.56687/9781447344520-011

Plaza-Zamora J, Legaz I, Osuna E (2020) Age and education as factors associated with medication literacy: a community pharmacy perspective. BMC Geriatrics 20: 501. https://doi.org/10.1186/s12877-020-01881-5

Pouliot A, Vaillancourt R, Stacey D, Suter P (2018) Defining and identifying concepts of medication literacy: An international perspective. Research in Social and Administrative Pharmacy 14(9): 797–804. https://doi.org/10.1016/j.sapharm.2017.11.005

Powers BJ, Trinh JV, Bosworth HB (2010) Can this patient read and understand written health information?. JAMA 7: 76–84. https://doi.org/10.1001/jama.2010.896

Sauceda J, Loya A, Sias J, Taylor T, Wiebe J, Rivera J (2012) Medication literacy in Spanish and English: psychometric evaluation of a new assessment tool. Journal of the American Pharmacists Association 52: 231–240. https://doi.org/10.1331/JAPhA.2012.11264

Vamos S, Orkan O, Tetine S, Irving R (2020) Making a case for "Education for Health Literacy": An International perspective. International Journal of Environmental Research and Public Health 17(4): 1436. https://doi.org/10.3390/ijerph17041436

Vervloet M, van Dijk L, Rademakers J, Bouvy M, De Smet P, Philbert D, Koster E (2018) Recognizing and addressing limited pharmaceutical literacy: Development of the RALPH interview guide. Research in Social and Administrative Pharmacy 14(9): 805–811. https://doi.org/10.1016/j.sapharm.2018.04.031

Volkova A, Kovtun E (2021) Study of the concept of health literacy and approaches to its assessment. Social pharmacy in health care 7(1): 3–11. https://doi.org/10.24959/sphhcj.21.212

Weiss B (2018) The Newest Vital Sign: Frequently asked questions. Health Literacy Research and Practice 2(3): 125–127. https://doi.org/10.3928/24748307-20180530-02