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DIGITAL COMMUNICATIONS IN THE FUNCTION OF RAISING AWARENESS ABOUT ONCOLOGIC DISEASES – Differences in responses between respondents with different demographic characteristics –

Abstract: At a time when the use of digital technologies has become totally available to a large number of people, digital transformations in the domain of health enable significant changes when it comes to knowledge, information and provision of healthcare services.Therefore, in the conditions of an increase in the number of people suffering from malignant diseases, the application of digital communications provides new frameworks for the provision of healthcare services as well as the organization of some preventive activities.

The paper tests the differences in answers between respondents who have different demographic characteristics, general health assessment, performed screening and received information about malignant diseases.

Carrying out this research, the authors want to draw attention to the current issues of the healthcare system, in order to define some strategies for new ways of doing business in healthcare. All their efforts are in that context.

Keywords: Digital communications, patient awareness, information, demographic characteristics, oncological diseases

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Abstract: U vremenu kada je korišćenje digitalnih tehnologija u potpunosti postalo dostupno velikom broju ljudi, digitalne transformacije u oblasti zdravstva omogućavaju značajne promene u domenu znanja, informisanja i pružanja zdravstvenih usluga. Upravo, u uslovima povećanja broja obolelih od malignih bolesti, primena digitalnih komunikacija daje nove okvire pružanja zdravstvenih usluga, kao i organizovanja preventivnih aktivnosti. U radu se testiraju razlike u odgovorima između ispitanika različitih demografskih karakteristika, procene opšteg zdravlja, obavljenom skriningu i primljenim informacijama o malignim bolestima.
Autori sprovedenim istraživanjem upravo žele da skrenu pažnju na aktuelne probleme zdravstvenog sistema, kako bi se definisale strategije za nove načine poslovanja u zdravstvu. U tom kontekstu su i svi njihovi napori.

Ključne reči: digitalne komunikacije, svest pacijenata, informacije, demografske karakteristike, onkološke bolesti

Introductory consideration

The 21st century is characterized by the globalization of society, which becomes the most significant and strongest driving lever of modern civilization and represents mutual connection, conditioning and dependence of technological progress, knowledge, ideas and market economy. Modern society is a society of digital technologies that are omnipresent in every single part of human life and which requires improving digital literacy skills and overcoming obstacles such as: attitude, age, social and economic status, language and regional availability of resources. Digital technologies have become an integral part of every individual's daily life, primarily because of easy and fast access to information and fast flow of data. In this way, people satisfy personal, interpersonal, social, cultural, existential and other forms of life[1].

In the dynamic process of globalization, the development of information technologies has an impact on the creation of some new competencies and as a result the barriers to international exchange of information and business, the creation of competitive advantages, as well as the exchange and connection of research experiences are removed. The mentioned dynamic is accompanied by the creation of new development strategies and certain activities for their realization, which are based on new digital literacy and new skills necessary for quality use of information,communication technologies and digital media.

A significant determinant of a nation's ability to be successful on the path of global progress is the preservation of people's health[2]. Medical knowledge, connected with the achievements of electronics, robotics and information technologies achieve significant achievements in order to preserve health and cure. By exchanging knowledge and modern achievements in the field of medicine, states can create adequate mechanisms for the healthcare system, which are reflected in joint projects of education, promotion of healthy lifestyle habits and all with the goal of health prevention. That is why

achievements in medicine, no matter where they originate, belong to all people, they have no borders and experts from certain fields and their teams generously transfer their knowledge and experiences around the world through digital media.

Current affairs come from the WHO strategy which[3] taking into account the previous experiences of countries and organizations, defines the interconnectedness of digital technologies, the way of collecting, managing and evaluating health data in accordance with established principles of good medical practice, while at the same time consider the sustainability of innovations and their feasibility, scope and inclusiveness[3]. WHO insists on identifying priority areas in which advice on digital health would be useful in terms of preventive activities and care, while respecting existing standards, data security, respect for ethical and legal principles.

In the paper, the authors investigate the impact of digital communications on the provision of information about health and oncological diseases, with the goal of raising awareness, prevention and early screening. Its social application is to practically use the results of the research while considering the potential of digital communications[4] in the promotion of health and the prevention of oncological diseases, both theoretically and on a practical example, highlight the importance of digital communications in the implementation of prevention programs and raising awareness of malignant diseases at the local and global level. The authors present their views in the paper based on the fact that digital communications in the healthcare system are necessary in order to raise awareness about oncological diseases and increase the information of the population.

Methodological considerations – research instruments and results

In the research is used *Questionnaire on digital communications in the prevention of oncological diseases* which contains 25 questions and comprises of many sections. The questionnaire was sent to the respondents on the social network *Facebook*. In addition to descriptive statistics, statistical testing analyzes were also used.

- gender (male-female)
- age (≤ 29; 30 to 39; 40 to 59; ≥ 60)
- education (no school, primary school, secondary school, faculty)
- marital status (married, divorced, widower/widow, single).

According to *the gender distribution,* both genders are represented in the research, namely 54% or 81 respondents are female and 46% or 69 respondents sre male. There is no significant difference in gender distribution between respondents. According *to age*, 61% of the respondents are up to 40 years old, which is in line with the fact that the social network on which the questionnaire was forwarded is mostly followed by younger people[5]. The largest number, 43% or 63 respondents are married, 37% or 53 respondents are single, 14% 23 respondents are divorced and 6% or 9 respondents

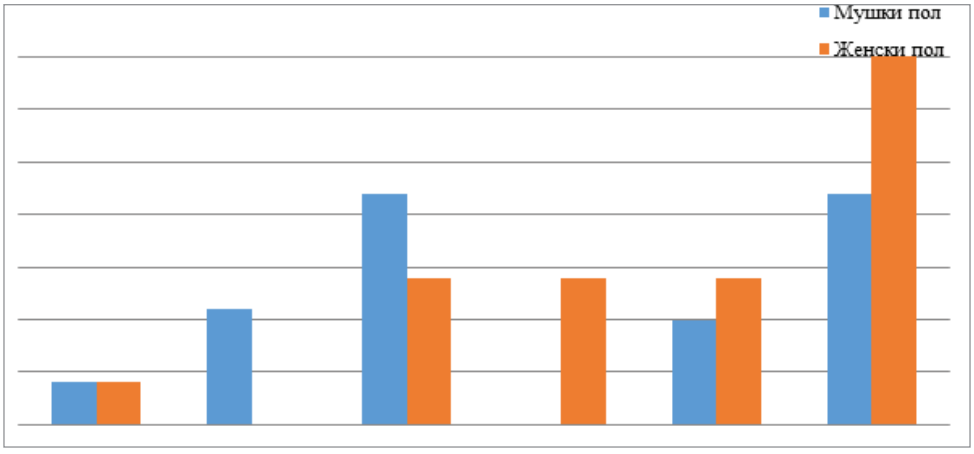
are widowed. Based on the demographic characteristics of the respondents according to the *level of education,* the largest number 59% or 88 respondents have finished secondary education, 25% or 38 respondents have graduated from university, 13% or 19 respondents have finished primary school and 3% or 5 respondents have no education. Referring again to the *Pew Research Center's report,* 60% of adults with a secondary school diploma or less use Facebook, 71% have a college degree, while 77% of users have a university degree[5].

The analysis first begins with the presentation of the existing differences in the responses of respondents with different demographic characteristics. It was tested whether there are differences of respondents with different demographic characteristics in terms of health assessment, cancer screening test and cancer incidence assessment.

By testing the use of the t-test, it has been shown that there are only statistically significant differences in the subjective assessment of cancer and the gender of the respondents. Men had a lower level of subjective evaluation of cancer (M=4.79, SD=2.93) in comparison to women (M=5.49, SD=2.67; t(148)=4.62, p=.068).

The chi-square test was further used in the analysis to test whether there are differences between respondents of different demographic characteristics and reading written information from brochures about malignant diseases. No statistically significant difference was found between respondents of different gender, age, marital status and education. The same test was also used to check whether there are differences when it comes to the information sources from which respondents of different demographic characteristics are informed. Regarding different sources of information about malignant diseases, the graph (1) shows information on how men were informed in comparison to women.

Graph 1. Differences in the source of information about malignant diseases in relation to gender

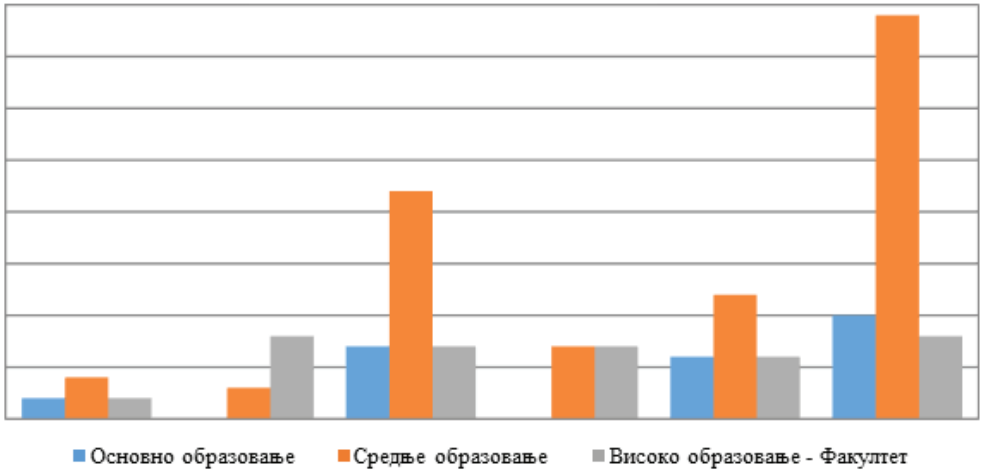


Source: Sinanovic[6], 2020: 61

There is a statistically significant difference obtained by the Chi-square test in relation to the sources of information of male and female respondents $\chi 2$ (5, n=150)=29.63, p=.000.

No statistically significant difference was shown between respondents of different ages in relation to the sources of information about malignant diseases. The analysis did not show the existence of a statistically significant difference between respondents of different marital status. It was also analyzed how respondents with different educational backgrounds were informed about malignant diseases. Graph 2 shows how those with the primary, secondary and university education were informed. There is a statistically significant difference obtained by the Chi-square test in relation to the sources of information of respondents with different levels of education, with the absence of the assumption of the minimum expected frequencies in the fields $\chi 2$ (10, n=150)=25.63, p=.004.

Graph 2. Differences in the source of information about malignant diseases in relation to education



Source: Sinanovic[6], 2020: 62

The existence of differences in the need for information in relation to different demographic characteristics is analyzed below. The gender difference of respondents was analyzed and their need for more information about malignant diseases. A statistically significant difference was determined using the Chi-square test in relation to the need for information among male respondents in comparison to female respondents $\chi 2$ (2, n=150)=7.91, p=.019. The analysis did not show a statistically significant difference in relation to the need for more information about malignant diseases and respondents of different age, marital status and education.

In order to examine whether there are differences in behavior in the online environment between respondents of different demographic characteristics, the most used social platforms and the frequency of use of social platforms were analyzed .On that occasion, it was determined that there was only a difference between the gender of the respondents and the most used social media platform. We can conclude that there is a statistically significant difference obtained by the Chi-square test in relation to the most frequently used social media platforms of male in comparison to female respondents. $\chi 2$ (2, n=150)=10.36, p=.006.

Regarding the difference in demographic characteristics related to receiving messages about health on different social platforms (WhatsApp, Facebook, Twitter), the only statistically significant difference obtained by the Chi-square test is related to receiving messages about health through the Twitter social platform and male respondents compared to female respondents $\chi 2$ (2, n=150)=7.80, p=.021.There is also a statistically significant difference between respondents of different levels of education for the same question $\chi 2$ (4, n=150) =8.72, p=.068. On the other side, the analysis of differences in receiving messages about health on social platforms (WhatsApp, Facebook, Twitter) in relation to age and marital status did not establish the existence of statistically significant differences. In a further analysis it was examined whether there is a difference in relation to the influence of social networks on the decision-making about healthcare of family members of respondents with different demographic characteristics. Finally, it was determined that there is a statistically significant difference obtained by the Chi-square test in relation to age. $\chi 2$ (8, n=150)=15.47, p=.051. The research also showed that there was a statistically significant difference obtained by the Chi-square test in relation to the medical treatment according to the post on social media without consulting a doctor related to gender $\chi 2$ (2, n=150)=12.001, p=.002. The analysis did not show a statistically significant difference between respondents of different demographic characteristics in relation to a conversation with a doctor or other healthcare professional about the accuracy of information received from the social media platform.

In the further analysis of the research on the differences between respondents with different demographic characteristics and numerous analyzed attitudes, the existence of a significant statistical difference was clearly established by the Chi-square test related to gender, according to the following attitudes: a) attitudes about the platform with the best health information $\chi 2$ (4, n=150)=11.12, p=.025; b) attitude about talking online with a medical professional about health problems or the health of family members from home $\chi 2$ (2, n=150)=9.53, p=.009; c) but also the attitude about the possibility of contact with a doctor by mobile phone in case of need for health advice of respondents of different gender $\chi 2$ (2, n=150)=41.22, p=.000. It was also confirmed that there is a statistically significant difference obtained by the Chi-square test in relation to the attitude about the possibility of contacting a doctor by mobile phone

in case of need for health advice in relation to marital status $\chi 2$ (6, n=150)= 12.88, p=.045. In the analysis, no statistically significant difference was found between respondents of different demographic characteristics and visits to health forums, as well as important experiences and recommendations of people with similar health problems. The difference has not been determined even in terms of the possibility of contacting a doctor by mobile phone in case of need for health advice and having a health application on a mobile phone.

In the second part of the analysis it is examined the link between the performed screening test for cancer and different sources of information about malignant diseases, the impact of messages from social networks on the decision making about healthcare, discussions about the accuracy of information from social networks with a doctor, visits to forums, the importance of the experience of people who have similar health conditions, online conversations with a doctor, mobile phone contact with a doctor about having a mobile health application. What we discovered in this part of the analysis is that there is a statistically significant difference obtained by the Chi-square test related to the respondents who completed the screening test and: a) the need for more information about malignant diseases $\chi 2$ (4, n=150)=7.87, p=.097; b) confirmation of the accuracy of information from social media $\chi 2$ (4, n=150)=11.49, p=.022; c) treatment based on a post found on social media without consulting a doctor $\chi 2$ (4, n=150)= 14.17, p=.007; d) online communication with a medical professional from home $\chi 2$ (4, n=150)=9.12, p=.058; e) the possibility of contacting a doctor by mobile phone in case of need for health advice $\chi 2$ (4, n=150)=11.54, p=.021.

Emphasis is also placed on examining the relationship between the need for more information about malignant diseases and different sources of information about malignant diseases, the influence of messages found on social networks on the decision about healthcare, discussions about the accuracy of information from social networks with a doctor, visits to forums, the importance of the experience of people who have similar health problems, online conversations with a doctor, mobile phone contact with a doctor about having mobile e-health applications.

It has been observed that there is a statistically significant difference obtained by the Chi-square test in receiving messages about health on a certain platform in relation to respondents with different needs for information about malignant diseases, namely: on *Facebook* $\chi 2$ (4, n=150)=43.14, p=.000 and on *Twitter* $\chi 2$ (4, n=150)=8.65, p=.071. A statistically significant difference obtained by the Chi-square test is also found in the attitude about the platform with the best information about health in relation to the need for information about malignant diseases $\chi 2$ (8, n=150)=14.89, p=.061.

Furthermore, correlation was used in the analysis in order to determine whether there are connections between the different attitudes of the respondents, what their strength is and what type they are. In the table (1) which follows, only statistically significant relationships are shown.

Table 1. Correlation coefficients

		Self treatment according to a post found on social networks	The importance of recommendations and experiences of people from the forum	Communication online/from home with the doctor	Telephone contact with the doctor
Confirmation of information found on social networks about health	Correlation coeficient	.239**			
	P	0.001			
	N	150			
Visit to forums about health	Correlation coefficient		.526**		
	P		0.000		
	N		150		
The importance of recommendations and experiences of people from the forum	Correlation coefficient			.481**	.362**
	P			0.000	0.000
	N			150	150
Communication online/from home with the doctor	Correlation coefficient				.712**
	P				0.000
	N				150

Source: Sinanovic[6], 2020: 77

The correlation coefficients show that people in most cases (using modern means of communication and modern technology) prefer online communication from home with a doctor, but also a large number of them (having confidence first of all in the spoken word) does not reject telephone contact with the doctor.

Conclusion

Health information technology is increasingly becoming a part of standard medical care, effective and available doctor-patient communication at any time not only improves the emotional health of patients, but also helps in management of symptom, functional and physiological status of patients and pain control[7].

Digital technologies are the new reality of modern society, changing the way of life and the framework of functioning at a very fast speed[8] enabling swift access to

information, change of knowledge, intelligence, action and business[9].Communication through digital technologies is essential for providing high-quality clinical practice because it enables: individual care that respects patient's autonomy, safer and more efficient healthcare, better disease outcomes, more satisfied and independent patients, and more efficient and cost-effective services of care and treatment. Precisely because of the high frequency of malignant diseases and the high mortality rate in order to implement the prevention and early detection of malignant tumors, as well as better diagnostics, treatment and care of patients, it is necessary to develop and implement comprehensive national programs for the prevention and control of malignant diseases. Prevention of malignant diseases has enormous public health potential and is the most effective approach to malignancy control. Appropriate application of knowledge at all levels of healthcare and comprehensive mobilization of the nation in the fight against cancer is possible through the use of information and communication technologies, primarily in raising people's awareness of oncological diseases.

Prevention of malignant diseases has a huge public health potential and is the most effective approach to control, because early diagnosis of cancer saves lives and reduces treatment costs. It is necessary to empower the entire community by creating and implementing media campaigns and increasing people's information about digital health, with the aim of obtaining swift and expert health advice[10]. New digital solutions in the service of health in addition to incentives to adopt healthy lifestyle habits[11] reduction of risk factors in order to prevent malignant diseases also enable overcoming the inequality of healthcare systems in the provision of services[12]. The Internet connects supreme experts from various parts of the world who generously share their knowledge with both colleagues and patients in order to provide comprehensive and quality healthcare[13,14,15]. There is evidence that online communication with healthcare providers improves the quality of health and that healthcare consumers would benefit from increased partnerships between health information technology and healthcare providers.[6] Numerous innovations expand the possibilities of health action in order to meet the basic goal - to reach the highest possible level of improvement and preservation of people's health. With the help of the Internet, information about health is no longer in the exclusive possession of doctors - it becomes available to the public, which enables individuals to take an active interest in solving their health problems and thus become equal members of the healthcare team[16].

The government is responsible for the health of the nation and should strengthen and develop programs for the prevention of malignant diseases, but also each individual is responsible for its health. Digital media provide unlimited opportunities for information, without borders and language barriers. They enable real and confident information, contact with experts from various fields of medicine, timely counseling - that's why the only correct choice is: *let's get informed and choose health!*

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