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Original Article

Predictive Factors for Online Health Information-Seeking Behavior among Adults in the Russian Federation

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Abstract

Background: The internet is fast becoming one of the key instruments for seeking health-related information. This study aimed to investigate factors associated with internet use for health information among adults in the Russian Federation and to identify factors that explain its variation.

Methods: The data were collected from the online survey conducted in Russian Federation on Aug-Sep 2020. A bivariate chi-square test was used to identify factors for further analysis. The binomial logistic regression model was fitted to the data to determine the relationship between dependent and independent variables.

Results: Overall, 1319 adults' survey submissions were analyzed. The binomial regression model showed women (OR 1.507, 95% CI 1.152–1.972), those with higher education level (OR 2.688, 95% CI 1.380–5.234), avid Internet users (3–4 h per day OR 2.187, 95% CI 1.383–3.460; 5+ h per day OR 2.361, 95% CI 1.475–3.781) are more likely to seek the health information on the Internet. Older participants (35–49 yr OR .701, 95% CI .498–.988; 50+ yr OR .624, 95% CI .430–.907) and those who live in rural areas (OR .469, 95% CI .308–.712) are less likely to use the internet for health information.

Conclusion: It is important to promote health information-seeking behavior among men, older, less educated individuals, and those who live in rural areas. The improvement of digital skills and infrastructure may engage those who experience difficulties accessing health information over the internet.

Keywords: Information-seeking behavior; Health behavior; Health information; Health communications

Introduction

The internet is fast becoming one of the key instruments for seeking health-related information (1-3). The number of people using the internet for health information was grown during recent years in both developed (2, 4-7) and developing (8-11) countries. The average internet penetration rate in the Commonwealth of Independent States (CIS) countries, which includes the Russian Federation, is 72% (12). The Russian Public Opinion Research Center daily monitoring system WCIOM-Sputnik reports that over 72% of Russian adults use the internet daily with an overall internet penetration rate of 83% (13).

A considerable literature has grown up around the theme of search engines, web portals, and social media as leading sources of health information for the population (7, 14-16). Patients nowadays are comfortable using the internet as the source of health information in various scenarios (17, 18). Previous studies conducted in developed countries have explored the rate of those who use the internet for health purposes of

up to 80% (1-6, 19, 20). It explains an increasing interest in online health information-seeking behavior (oHISB) and its underlying sociodemographic factors and behavioral patterns that explain patients' willingness to use the internet for health information.

oHISB is an important aspect of patient health literacy (21), their health-related outcomes (22), and patient-physician communication (23, 24). Better access to health information enables patients to be more involved in the decision-making process (18).

However, there is no single study exists which observed the situation around oHISB in CIS countries. This study was conducted to generate fresh insight into oHISB among adults in CIS countries, which is useful to understand current trends both in developing and developed countries.

There were two primary aims of this study:

1. To investigate factors associated with internet use for health information among adults in the Russian Federation.
2. To identify factors that may explain the variation of internet use for health information.

Materials and Methods

Research Design and Data Collection

We collected the data for this study from the online survey conducted on Aug-Sep 2020. The target population of the survey was Russian Federation adults who at least rarely use the internet.

The section analyzed in this study contained questions for obtaining basic information about the participant, including age, sex, place of residence, education level, average daily internet use time, number of chronic diseases, medical visits in the past year, internet use for health information, and informed consent checkbox which, if not checked, prevented the survey submission. The top section of the page contained the survey purpose description, a link to the privacy policy page, and the statements of participants' right not to finish the questionnaire for any reason at any time point.

Exclusion criteria

The initial sample contained 2,090 completed submissions. The median time to complete was 428.5 seconds with IQR 333–569 sec. All the participants whose time to complete was less than 333 sec (Q1) were excluded from the final sample. Exclusion criteria also included the place of residence outside of the Russian Federation and age lower than 18 years. We counted each participant as one observation, providing the independence of observations.

Independent Variables

Independent variables, including *sex* (categorical), age (continuous), an education level (ordinal), average daily internet use time (ordinal), number of chronic diseases (ordinal), number of medical visits in the past year (ordinal) were selected as potential determinants. We transformed the age variable from continuous to categorical (18–34, 35–49, and 50+ yr old) to consider the variability of the dependent variable in age groups.

Dependent Variable

We assumed Internet use for the health information variable as a dependent variable. It had only two possible values (*Yes*/*No*) thus have mutually exclusive and exhaustive categories and considered as dichotomous.

Data Analysis

We conducted a chi-square test of association to identify a significant difference between independent variables' values to determine factors for further analysis. The multivariate binomial logistic regression was conducted to determine the relationship between dependent and independent variables.

Results were significant at P-value<.05.

All statistical analyses were carried out using IBM SPSS Statistics, ver. 24 (IBM Corp., Armonk, NY, USA).

Ethics approval

The survey protocol was reviewed and approved by the Sechenov University Local Ethics Committee, Moscow, Russia (minutes of the meeting

N19-20 from 2nd July 2020). The survey web page contained comprehensive information concerning the objectives of the survey, participants' rights, and privacy policy statements. Built-in Javascript did not let to submit the survey form without a checked box of informed consent.

Results

Overall, 1,319 participants were included in a study after we had applied exclusion criteria. The median age of participants was 40 yr old (min-max: 18–81 yr). 77.3% (95% CI: 74.9%–79.5%) of respondents reported that they used the internet for health information.

Chi-square tests for association

The sample proportions of age, place of residence, education level, average daily internet use time, number of chronic diseases, and number of medical visits during the past year along with the bivariate chi-square test for internet use for health information are listed in Table 1.

Table 1: Distribution of factors and bivariate chi-square tests of association for internet use for health information among Russian adults

Variables	*Categories*	*N*	*N%*	*Yes (95% CI)*	*No (95% CI)*	*df*	*χ2*	*P*
Sex	Male	618	46.9	73.3 (69.7 – 76.7)	26.7 (23.3 – 30.3)	1	10.349	.001
	Female	701	53.1	80.7 (77.7 – 83.5)	19.3 (16.5 – 22.3)			
Age	18-34 yr	485	36.8	81.9 (78.2 – 85.1)	18.1 (14.9 – 21.8)	2	13.773	.001
	35-49 yr	444	33.7	77.5 (73.4 – 81.2)	22.5 (18.8 – 26.6)			
	50+ yr	390	29.6	71.3 (66.6 – 75.6)	28.7 (24.4 – 33.4)			
Place of Residence	Urban	1188	90.1	79.0 (76.6 – 81.2)	21.0 (18.8 – 23.4)	2	19.968	< .001
	Rural	113	8.5	61.1 (51.9 – 69.7)	38.9 (30.3 – 48.1)			
	Semi-urban	18	1.4	66.7 (43.7 – 84.7)	33.3 (15.3 – 56.3)			
Education Level	Basic General	52	3.9	67.3 (53.9 – 78.9)	32.7 (21.1 – 46.1)	4	14.626	.006
	General Secondary	134	10.2	70.9 (62.8 – 78.1)	29.1 (21.9 – 37.2)			
	Secondary Vocational	563	42.7	75.1 (71.4 – 78.6)	24.9 (21.4 – 28.6)			
	Higher	541	41.0	82.1 (78.7 – 85.1)	17.9 (14.9 – 21.3)			
	Post-Graduate Advanced	29	2.2	75.9 (58.4 – 88.5)	24.1 (11.5 – 41.6)			
Average Daily Internet Use Time	< 1 hour	134	10.2	61.9 (53.5 – 69.8)	38.1 (30.2 – 46.5)	3	29.438	< .001
	1-2 h	277	21.0	72.2 (66.7 – 77.2)	27.8 (22.8 – 33.3)			
	3-4 h	425	32.2	80.7 (76.8 – 84.2)	19.3 (15.8 – 23.2)			
	5+ h	483	36.6	81.4 (77.7 – 84.6)	18.6 (15.4 – 22.3)			
Number of Chronic Diseases	No	569	43.1	78.2 (74.7 – 81.5)	21.8 (18.5 – 25.3)	3	1.470	.689
	One	445	33.7	77.5 (73.5 – 81.2)	22.5 (18.8 – 26.5)			
	Two and More	217	16.5	74.2 (68.1 – 79.7)	25.8 (20.3 – 31.9)			
	Not Certain	88	6.7	77.3 (67.7 – 85.1)	22.7 (14.9 – 32.3)			
Medical Visits in the Past Year	Did not visit	301	22.8	73.8 (68.6 – 78.5)	26.2 (21.5 – 31.4)	3	4.764	.190
	1-3 visits	750	56.9	79.1 (76.0 – 81.9)	20.9 (18.1 – 24.0)			
	4-6 visits	183	13.9	74.3 (67.6 – 80.2)	25.7 (19.8 – 32.4)			
	7+ visits	85	6.4	80.0 (70.6 – 87.4)	20.0 (12.6 – 29.4)			

A comparison of independent variables associated with dependent variable let to determine which factors to include in the binomial logistic regression model. Based on the chi-square test result, sex, age, place of residence, education level, and average daily internet use time variables

were considered as predictors for internet use for health information.

Binomial logistic regression for internet use for health information

The binomial logistic regression was fitted to the data to test the relationship between predictor variables and participants' use of the internet for health information. As shown in Table 2, sex, age, place of residence, education level, and average daily internet use time were found to be significantly associated with intention to use the internet for health information.

The omnibus test results showed a significant improvement (chi-square=72.826, df=12, *P*<.001) in the accuracy of an alternative model with explanatory variables over the baseline model. The Hosmer and Lemeshow test of the goodness-of-fit result provided a significance level of *P*>.05. It let us accept the null hypothesis of correct regression model specification and consider the alternative model as a good fit to the internet use for health information (chi-square=9.064, df=8, *P*=.337).

The model explained 8.2% (Nagelkerke R-square) of the variance in respondents' internet use for health information. The model correctly classified 77.9% of cases.

Table 2: Binomial logistic regression results of internet use for health information among adults in the Russian Federation

Variables	*Categories*	*B*	*S.E.*	*Wald*	*df*	*P*	*OR*	*95% CI for OR*
Sex (*ref. Male*)								
	Female	.410	.137	8.931	1	.003	1.507	1.152 – 1.972
Age (*ref. 18-34 yr*)				6.747	2	.034		
	35-49 yr	-.355	.175	4.116	1	.042	.701	.498 – .988
	50+ yr	-.471	.191	6.112	1	.013	.624	.430 – .907
Place of Residence (*ref. Urban*)				13.253	2	.001		
	Rural	-.758	.213	12.615	1	< .001	.469	.308 – .712
	Semi-urban	-.500	.518	.929	1	.335	.607	.220 – 1.676
Education Level (*ref. Basic General*)				14.431	4	.006		
	General Secondary	.291	.364	.636	1	.425	1.337	.655 – 2.732
	Secondary Vocational	.679	.333	4.146	1	.042	1.972	1.026 – 3.790
	Higher	.989	.340	8.458	1	.004	2.688	1.380 – 5.234
	Post-Graduate Advanced	.805	.549	2.154	1	.142	2.238	.763 – 6.560
Average Daily Internet Use Time (*ref. <1 hour*)				16.436	3	.001		
	1-2 h	.378	.232	2.648	1	.104	1.459	.926 – 2.301
	3-4 h	.783	.234	11.184	1	.001	2.187	1.383 – 3.460
	5+ h	.859	.240	12.800	1	< .001	2.361	1.475 – 3.781
Constant		.026	.380	.005	1	.945	1.027	

ref. reference category

Discussion

The current study was the first one on online health information-seeking behavior predictors conducted in CIS countries. 77.3% of adults used the internet for health information. This result showed a greater rate of adults using the internet for health information than in previously conducted studies in developed countries that reported the proportion of adults who use the internet for health information between 28.1% and 68.4% (1, 2, 4–6, 20). However, some studies are in line with the current study results: Pew Research Center reported that 80% of United States internet users accessed health-related information (19); the study conducted in Poland also showed that 76.9% of survey respondents used the internet for health information (3).

In this study, women participants were found to use the internet for health information more actively than men did. These results in accord with recent studies showing that women are more engaged in health-related topics (2–4, 19, 20, 25).

In accordance with the present results, previous studies have shown that younger people are more engaged to use the internet for health information (5, 19, 26). It is encouraging to compare this result with those in earlier study which reported young people to be more interested in new technologies than older people who struggle to adapt modern technologies to their routine needs (3). Digital skills may be also associated with daily internet use. This is supported by our finding of a greater rate of internet use for health information associated with greater average daily internet use time.

We found that adults who live in urban areas have a greater interest in internet use for health information. This result corroborates the ideas of researchers (3, 19) that suggested that living in the urban area provides more opportunities to have a better education, higher income, access to computers and devices (and by that better digital skills), thus correlating with socioeconomic status found to be strongly associated with internet use for health information (2, 5, 20, 26).

What is surprising is that both the number of chronic diseases and the number of medical visits in the past year were not found to be associated with internet use for health information. No significant difference in health information seeking may be explained by previous research into health information-seeking behavior, which links better health and more interest in general health topics on the internet (3).

Limitations of the study

This study is not without limitations. It is important to bear in mind the bias in these responses. Results interpretation should be limited to those who at least rarely use the internet and not to all the population due to the survey conducted over the internet and by that did not include those who did not use the internet at all. Notwithstanding the relatively limited sample, this work offers valuable insights into oHISB among adults.

Conclusion

The findings of this study have several important implications for future practice. The online health information-seeking intentions among Russian adults highlight the importance of the development and improvement of health facilities and health-related web resources. Even though younger adults more actively use the internet for health, the number of elder online health information seekers is growing, so it is important to engage them in health topics and work on their adaptation to new technologies. These findings have significant implications for the understanding of how the intention to use the internet for health information differs between sociodemographic groups. The results of this research support the idea that healthcare providers and public health specialists should work on new approaches that may be effective to make men more interested in health topics. Since education level was found to be associated with oHISB, it is also important to provide the health information in an easier way and context for those with lower edu-

cation level. It is important to improve internet accessibility for those who live in rural areas and has a lower socioeconomic status to make them more engaged in health information. Taken together, these findings support the idea of existing inequities in health-related internet use by different sociodemographic groups and the need to promote health information-seeking behavior among the population.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The authors declare that there is no conflict of interests.

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