

Predictors of the Use of Physician's Televisits During the COVID-19 Pandemic in Poland

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Abstract. Telemedicine-based contacts between patients and physicians were allowed in Poland only in 2016. However, using such services was not common due to the lack of a relevant reimbursement scheme. During the COVID-19 pandemic, the use of telemedicine and e-health systems increased radically. The aim of this study was the assessment of factors predicting the use of physician's televisit in the Polish general adult population. The analysis was based on data from an online survey of 2410 Internet users performed in October 2020. The logistic regression modeling revealed that both health (HL) and e-health literacy (eHL), the use of e-health services before the pandemic, the use of social media, and from sociodemographic variables, age, gender, vocational status, and marital status were significant predictors of obtaining televisit from a physician during the pandemic. Pre-pandemic experience with ehealth applications strongly predicted utilizing televisits during the pandemic. Respondents with higher levels of HL and eHL were more likely to use such telemedicine services than those with lower levels.

Keywords. e-health, telemedicine, televisit, e-health literacy, health literacy, preventive measures

1. Introduction

The challenge of providing adequate care during the pandemic has resulted in many countries in a spectacular increase of interest in the use of e-health and telemedicine. In the pre-COVID era, the implementation of e-health solutions in the Polish healthcare system was very slow. Only a limited number of patients/citizens could benefit from these technologies. The only acceptable e-health service was providing health information via Internet websites for a long time. Any services meeting the criteria of health-related contact between the doctor and the patient were pilot installations or were located in the gray area, such as portals offering online psychological counseling.

The last two decades have been groundbreaking in developing telemedicine and e-health services. In many countries, legislative initiatives have been taken to allow the provision of medical services with the use of ICTs [1][2].

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As a result, some services, such as e-prescription and e-consultation, have been available for many years. In other countries, legal systems have not kept pace with technological progress.

In Poland, as late as 2016, changes in the law governing the provision of health services by physicians and other health care professionals were introduced. This enabled the use of teleinformatic systems to provide care to patients. The COVID-19 pandemic has coincided with intensified efforts to establish e-health services, e.g., e-prescription, to society. The quick extension of the scope of ehealth services to society, which until the pandemic had not used such services frequently, was a form of "shock therapy." Initial reactions of patients to telemedicine services were surprisingly positive [3]. However, later critical voices about their usefulness emerged, evidenced by the results of surveys conducted by public opinion polling companies [4]. Unfortunately, these general surveys focused more on assessing the scale of the phenomenon and on descriptive statistics without attempting to answer questions about the key factors influencing the decision to use telemedicine services, especially physician's televisits.

This study's main aim was to assess factors predicting the use of physician televisit in the general Polish adult population based on the data from the computer-based web-based interviewing (CAWI) survey performed after six months of the COVID-19 pandemic.

2. Methods

The analysis was based on data from an online survey of 2410 adult Polish Internet users performed in October 2020. The questionnaire used in the survey consisted of 55 items. It encompassed, apart from a set of questions asking about sociodemographic variables, a 16-item European Health Literacy Scale (HLS-EU-Q16) [5], an 8-item e-Health Literacy Scale (eHEALS) [6], six items asking about adhering to specific preventive measures, and items asking about the use of e-health services during the pandemic. The study was performed after receiving the agreement from the Bioethical Committee at Jagiellonian University (decision no 1072.6120.99.2020 from April 23, 2020).

Univariable regression models were developed for the dichotomous variable reflecting the use of physician's televisit six months after the announcement of the pandemic in Poland. Independent variables included: sociodemographic variables, health (HL) and e-health literacy (eHL) scores, combined score reflecting compliance with preventive measures, the use of social media, and the use of e-health services in the period before the pandemic in Poland.

For the independent variables included in the regression models, odds ratio (OR), 95% confidence intervals (95%CI), and p-values were reported. P-values below 0.05 were considered significant.

3. Results

The respondent's mean age (standard deviation, SD) was 40.8 (14.5) years. There were 51.2% of females in the study sample. The residents of rural areas made up 34.5% and of cities with at least 100,000 inhabitants, 32.5% (n=783). 28.2% of respondents (n=679)

achieved a university level of education. In the study sample, 57.6% (n=1389) of respondents used physician's televisit during the pandemic.

Univariable logistic regression models (Table 1) showed that significant predictors of the use of televisit among sociodemographic variables included gender (OR, 95%CI for the comparison of males to females: 0.65, 0.56-0.77), age (1.01, 1.01-1.02), vocational status (OR, 95%CI for the comparison of students vs. employees, 0.45, 0.36-0.61), and marital status (OR, 95%CI for the comparison of married persons vs. singles: 0.56, 0.46-0.68). Respondents adhering to preventive measures recommended during the pandemic were also more likely to use televisit services (OR, 95%CI: 1.16, 1.09-1.24). An increase of eHL score by one point was associated with a 2% greater likelihood of using televisit (OR, 95%CI: 1.02, 1.003-1.04). Furthermore, social media user was 70-80% more likely to use televisit (depending on the daily time spent on social media use) than social media non-users. The persons for whom the HL score could not be calculated because of too many missing values were about 40% less likely to use televisit than respondents with inadequate HL (OR, 95%CI: 0.62, 0.46-0.83). Finally, respondents using e-health services before the pandemic were 250% more likely than non-users to utilize televisit during the pandemic (OR, 95%CI: 2.51, 2.06-3.06).

Table 1. Univariable logistic regression models for the independent variable reflecting the use of physician's televisit during the pandemic.

Variables	Categories	OR (95% CI)	p
e-Health literacy		1.02 (1.003-1.04)	0.022
Health literacy	inadequate#		
	problematic	1.15 (0.88-1.50)	0.320
	sufficient	0.92 (0.73-1.18)	0.523
	not determined	0.61 (0.44-0.84)	0.002
Adherence to preventive measures score		1.16 (1.09-1.24)	<0.001
ehealth services before the pandemic		2.51 (2.06-3.06)	0.000
Daily use of social media	no use#		
	<30 minutes	1.83 (1.29-2.59)	0.001
	30 – 90 minutes	1.81 (1.30-2.51)	0.000
	>90 minutes	1.70 (1.20-2.4)	0.003
Age		1.01 (1.003-1.02)	<0.001
Gender	female#		
	male	0.65 (0.56-0.77)	<0.001
Education	lower than secondary #		
	secondary	1.00 (0.80-1.24)	0.982
	post-secondary non-university	1.16 (0.86-1.57)	0.318
	university Bachelors	1.06 (0.79-1.42)	0.700
	university Masters	1.10 (0.84-1.44)	0.489
Place of residence	rural #		
	urban below 20,000	1.03 (0.77-1.39)	0.839
	urban 20,000–100,000	0.82 (0.66-1.02)	0.079
	urban 100,000–200,000	1.18 (0.87-1.60)	0.287
	urban 200,000–500,000	0.92 (0.68-1.24)	0.582
	urban above 500,000	0.80 (0.62-1.03)	0.086
Net monthly income per household member	≤1000 PLN #		
	1001–2000 PLN	1.14 (0.87-1.49)	0.332
	2001–3000 PLN	1.13 (0.86-1.49)	0.385
	>3000 PLN	1.07 (0.80-1.45)	0.643
Vocational status	employee #		
	self-employed or farmer	0.99 (0.73-1.35)	0.940
	retired or on a disability pension	0.95 (0.74-1.23)	0.715
	high school or university student	0.47 (0.36-0.61)	<0.001

	vocationally unemployed	passive	incl. 0.95 (0.70-1.28)	0.730
Marital status	a part-time job or other single #		0.76 (0.58-0.99)	0.045
	married or in partnership		1.99 (1.61-2.45)	<0.001
	widowed		1.35 (1.05-1.75)	0.021
	divorced or in separation		1.50 (1.12-2.02)	0.007

- reference category

4. Discussion

The study on the Polish population of Internet users showed that six months from the beginning of the COVID-19 pandemic, nearly 60% of respondents utilized remote physician visits. A rapid increase in the use of e-health and telemedicine services during the pandemic was reported in other countries, too [7]

In our study, physician's televisits were positively associated with age. Nguyen et al. showed that telemedicine services were less likely to be used by older patients, males, and those establishing care as new patients [8]. The highest likelihood of the use of telemedicine was observed in patients living 15 miles from their clinic. In Poland, the place of residence was not significantly associated with telemedicine. However, like in the USA sample [8], males were less likely to use such services. In turn, older respondents in the Polish sample were more likely to use e-health services. Still, this effect was probably associated with the analysis being based on data originating from the general Polish population. A systematic review by Alsabeeha et al. revealed that older adults were satisfied with telemedicine during the COVID-19 pandemic and favored remote visits compared to in-person visits [9].

The analysis reported in his paper clearly showed that pre-pandemic experience with ehealth services was associated with a 2.5 higher likelihood of using remote physician visits during the pandemic. This finding indicates that the appropriate promotion of e-health solutions should be an element of preparedness development for great public health challenges.

Digital HL, as expected, was positively associated with the use of telemedicine services. However, the relationship between their use and health literacy seems more complex. Persons with an undetermined level of HL, which may be a sign of very low interest in health issues, showed a lower usage of physician's televisits, probably because they did not have such a need. However, There was no significant difference in the use depending on the determined level of HL. These findings seem to oppose the results obtained by other authors [10].

The analysis presented in this paper was based on the assumption that the prevalence of the episodes prompting for seeking physician's advice among users and non-users of remote physician's visits was evenly distributed. However, the analysis encompassing only patients would surely yield more precise evidence about determinants of the use of telemedicine services during the pandemic. It should also be noted that after three months of the pandemic, the use of remote visits was declared by about 57% of adult Internet users. In the following years, the number of telemedicine users in the general population significantly increased, as reported by poll opinion companies. In the survey conducted in November 2022, 75% of respondents confirmed accessing remote services in the preceding six months [11].

5. Conclusions

Prior experience with e-health systems strongly predicts using such systems during public health challenges. As expected, higher eHL is associated with a higher likelihood of utilizing televisit during the pandemic. Persons showing low interest in health issues reflected by an undefined level of HL are more prone to underutilize physician's televisit. The use of social media reflects more intensive users of Internet applications and are also more prepared to use e-health applications exemplified by televisit.

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