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Acceptance of the COVID-19 vaccine based on the Health Belief Model in the Republic of Georgia: a cross-sectional study

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ABSTRACT

Introduction: The coronavirus disease (COVID-19) outbreak is an emerging global public health issue of the 21st century. Vaccine hesitancy as a global phenomenon was considered by the World Health Organization (WHO) to be one of the main threats to global health in 2019. In this study, we aimed to investigate COVID-19 vaccination uptake of the general public in Georgia, using a behavioral framework known as the Health Belief Model (HBM).

Material and methods: We performed an online survey using Facebook among Georgian adults aged 18 years and above from June 15 to July 18, 2021. The questionnaire included demographics (age, gender, marital status, education, employment status and income), self-perceived health status and perception towards COVID-19 vaccination by using HBM. The main constructs of the model were "perceived susceptibility", "perceived severity", "perceived benefit", "perceived barriers" and "cues to action".

Results: The survey generated a total of 394 responses. Of these, 50.8% were below the age of 25 years (29.53 ± 11.63) and 71.3% were female. Seventy-seven (19.5%) subjects had already received at least one vaccine dose against COVID-19 and 122 respondents (31.0%) reported that they had COVID-19 experience in the past. Regarding the HBM components, perceived benefits construct (OR = 6.18, 95% CI: 3.237-11.800), perceived barriers construct (OR = 0.52, 95% CI: 0.368-0.748) and cues to action construct (OR = 0.56, 95% CI: 0.369-0.850) were important predictors for vaccine uptake.

Conclusions: The low vaccination intention among Georgian residents highlights the significance of creating effective vaccine promotion programs based on the factors found in this study.

KEY WORDS: COVID-19, vaccination, Georgia, Health Belief Model.

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INTRODUCTION

The new coronavirus (SARS-CoV-2) and the disease it causes (COVID-19) are an emerging global public health challenge to all mankind, particularly in terms of the unprecedented financial cost and impacts on the quality of life of the citizens. As of 27 July 2021, it has led to over 4.1 million deaths in 223 countries or territories [1]. To optimize the existing situation and save more lives, the ideal arrangement would be to introduce and administer safe and effective vaccines against COVID-19 [2, 3]. The main pathway to deal with COVID-19 is to promote vaccination. As soon as the first vaccine was authorized by the U.S. and the European Union (and other stringent regulatory authorities) and was approved by the World Health Organization (WHO) in the list for emergency use, risk communication and mass vaccination campaigns against COVID-19 were introduced around the world [4, 5]. However, acceptance of the COVID-19 vaccine among the general population remains unclear and uncertain [6, 7]. The Republic of Georgia started registration for vaccination against COVID-19 in March 2021 and it will be available free of charge for Georgian citizens [8]. At the time of conducting this study (June 15 – July 18, 2021) a vaccine for COVID-19 has already become avail-

able. Nevertheless, even though the vaccine is widely available for the adult population of the country, part of the general population is not expected to get vaccinated, which can probably be explained by the phenomenon known as vaccine hesitancy [9], and it was listed by the WHO as one of the ten main threats to global health in 2019 [10].

According to the estimations of the main epidemiologic parameters, 55-82% population vaccination is required to achieve vaccine efficacy and herd immunity against SARS-CoV-2 [11]. Hence, identifying factors associated with acceptance of the COVID-19 vaccine is urgently needed to fill this vaccination policy gap and to better develop interventions and risk communication campaigns. In terms of predicting health-related behaviors of the population of Georgia and promoting health, the worldwide recognized Health Belief Model (HBM) has been adopted. The HBM proposes what factors are influencing behaviors [12]. The model was developed by social psychologists, particularly Hochbaum, Kegeles, Leventhal, and Rosenstock, in the 1950s to better explain the low level of participation in screening and immunization programs [13]. The main framework of this model contains five basic domains of individual belief and behavior. It mainly consists of "perceived susceptibility", "perceived severity", "perceived benefit", and "perceived barriers". In addition to the four key variables listed above, in 1966 Rosenthock added to the model "cues to action" [14].

Several recent studies have been conducted to examine various constructs of the HBM that could predict acceptance of the COVID-19 vaccine [15-21], although there are studies which assess intention to get vaccinated with the COVID-19 vaccine in Malaysia, China and Ethiopia [22-24].

The aim of this study was to assess respondents' perceptions of susceptibility and severity of the COVID-19 infection, benefits and barriers of the vaccine and cues to action using the HBM, as well as to examine sociodemographic characteristics including gender, age, education attainment, economic activity status, independently associated with willingness to get the vaccine against COVID-19. The information gained from this study can help to address vaccination policy gaps in the strategic framework, plan future education activities, and vaccination awareness campaigns to reduce vaccine hesitancy and adopt WHO recommendations.

MATERIAL AND METHODS

The survey (convenience sampling method) was conducted between June 15 and July 18, 2021 using the online Google Forms platform. The data collection process was led by all research team members. The survey link was advertised and distributed to the research team members via most popular social media platforms in Georgia (Facebook). Researchers used personal accounts of social network platforms of Facebook to disseminate and advertise the survey link to the public. Respondents were required to be Georgians, at least 18 years old, and able to understand and read Georgian language. Survey items were used to measure the participants' perception of COVID-19 vaccination. Questions were translated and adapted from previous studies conducted in Israeli and China [16, 23]. Items for the survey questions were translated by 2 independent translators separately and 2 individually translated items were compared to reach agreement after discussing with 4 authors to verify that the questionnaire's intended purpose was retained. The questionnaire was piloted with 7 people from the general population to assess the understandability of the questions. The respondents were informed that their participation was voluntary and informed consent was implied through their completion of the anonymous questionnaire. There were no personal or financial incentives provided for the participants. The study was approved by the Institutional Review Board of the School of Health Sciences, the University of Georgia (IRB Number 24-21).

The survey consisted of 34 questions divided into three sections: demographics (age, gender, marital status, education, employment status and income), self-perceived health status and perception towards COVID-19 vaccination by using the HBM.

The first section included questions related to participants' basic socio-demographic information (eight items). The second section assessed participants' experience of COVID-19 and perceived health status (four items). Information on participants' perception of COVID-19 and COVID-19 vaccination, such as perceived susceptibility (four items), perceived severity (two items), perceived benefits (six items), perceived barriers (five items), and cues to action (four items), was collected in the last section. The subjective perception of participants was assessed using an item rated on a five-point Likert scale that ranged from "1 = strongly disagree" to "5 = strongly agree".

STATISTICAL ANALYSIS

The data were analyzed using SPSS Statistics (version 26.0 for Windows) software. Descriptive analyses were performed for all study variables. To describe the study population characteristics, frequencies, percentages, means and standard deviations were used. To test the reliability of HBM measures, Cronbach's α test was used. Using data transformation, we calculated mean values of multiple choice questions for each HBM construct. Bivariate analysis using chi-square (χ^2) tests was applied to assess relationships between categorical variables. To determine the most relevant and significant determinants of COVID-19 vaccination intent in terms of HBM constructs, unadjusted binary logistic regression was performed ($p < 0.05$). The COVID-19 vaccine uptake (at least one dose) was used as the dependent variable, where

the original binary variable had two values (1 = had received at least one dose of vaccine against COVID-19, 0 = had not received any vaccine against COVID-19). The HBM constructs such as perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action were used as the independent variables. The model fit of logistic regression analysis was assessed using the Omnibus Tests of Model Coefficients and Hosmer-Lemeshow goodness-of-fit test. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated for each independent variable. All statistical tests were two-sided and *p*-values less than 0.05 were considered to indicate statistical significance.

RESULTS

DEMOGRAPHIC AND HEALTH-RELATED CHARACTERISTICS OF PARTICIPANTS

The survey was completed by a total of 394 participants. Respondents were predominately females; the sample included 109 males (27.7%) and 281 (71.3%) females; 50.8% of participants were below the age of 25 years. The age of the study participants ranged from 18 to 75 years, with a mean age of 29.53 ± 11.63. Of the total sample, 56.3% were unmarried, 55.3% had a bachelor level of education and 27.9% had postgraduate qualifications. The majority were urban residents (93.7%). Among the respondents, 29.7% were working in the private sector and 29.5% were students. Regarding the type of the job, 11.4% of the participants were working in the healthcare sector. All income groups were represented in the survey almost proportionately. The study showed less representation from the regions outside Tbilisi compared to the capital city where the researcher's institute belonged and showed an over-representation in the study.

In terms of COVID-19 experience, 122 respondents (31.0%) reported that they had a history of COVID-19 infection in the past. Regarding the history of illness, 30 respondents (7.6%) reported having chronic diseases, 205 (52.0%) reported their health status as good and 82 (20.8%) rated their current health as very good.

HEALTH BELIEFS ABOUT COVID-19 VACCINATION

The participants had mixed perception of susceptibility. Half (50.0%) of the respondents reported that there was a high chance of getting COVID-19 in the next few months; they also agreed that currently it was possible they would get COVID-19 (58.9%).

The respondents had mixed perceptions about the severity of COVID-19 infection. The majority agreed (86.6%) that complications of COVID-19 were serious, while 57.8% reported that they were afraid of getting COVID-19.

The participants had high perceptions about the benefits of the COVID-19 vaccination. The majority agreed that vaccination was a good idea to prevent COVID-19 (71.6%) and 74.1% believed that vaccination would decrease their chance of getting COVID-19 or its complications.

High perceptions of perceived barriers were also reported. Regarding perceived barriers of COVID-19 vaccination, 52.3% worried about the possible side effects of vaccination, 58.8% expressed concerns over the efficacy and 58.9% over the safety of the COVID-19 vaccine, while 28.4% worried that the COVID-19 vaccination requires too much time and effort from their side.

Regarding cues to action, the majority (74.9%) of participants reported that they would only take the COVID-19 vaccine if they were given adequate information about it. 38.6% reported that they were ready to receive the vaccine if many in the public would take the vaccine. The findings are summarized in Table 1.

DRIVERS OF COVID-19 VACCINATION UPTAKE

A total of 317 (80.5%) participants responded negatively to the COVID-19 vaccine uptake compared to the positive response where there only 77 (19.5%) who received at least a single vaccine dose.

Females (16.5%) expressed a higher uptake of the vaccine than males (3.0%). Among age groups, the 35-44 year old category was vaccinated most. By marital status category, married groups (9.9%) reported a positive response to receive the vaccine against COVID-19 ($p < 0.001$). Participants with a postgraduate academic degree (11.2%) expressed a higher positive response about vaccine uptake ($p < 0.001$). By monthly income level category, the highest income groups (> 483 U.S. dollars per month) expressed a positive response to receive the vaccine (10.2%, $p < 0.001$) compared to the low-income group, which reported negatively (31.2%).

A larger proportion of respondents with a history of COVID-19 infection (41.9% vs. 37.7%; $p = 0.009$) reported a positive response than those without a history of COVID-19 infection. Table 2 presents a summary of the findings.

RELIABILITY OF HBM ITEMS AND HBM PREDICTORS OF VACCINE UPTAKE

The internal validity of the perception towards COVID-19 vaccination by using the HBM items was assessed by calculating the Cronbach's coefficient α values for each HBM construct. The HBM predictor variables were (Table 1 and 3): perceived susceptibility (included 4 items, Cronbach α = 0.812); perceived severity (included 2 items, Cronbach α = 0.547); perceived benefits (included 6 items, Cronbach α = 0.964); perceived barriers (included 5 items, Cronbach α = 0.822); cues to action (included 4 items, Cronbach α = 0.688); all the Cronbach's α values were above 0.7, which indicates acceptable and sufficient values [25].

Direct logistic regression was performed to assess the impact of a set of predictor variables on the odds that

TABLE 1. Frequency table for Health Belief Model (HBM) constructs (perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action)

HBM constructs and variables	Strongly disagree, *n* (%)	Disagree, *n* (%)	Neither agree nor disagree, *n* (%)	Agree, *n* (%)	Strongly agree, *n* (%)	Mean (SD)
Perceived susceptibility						
My chance of getting COVID-19 in the next few months is high	12 (3.0)	94 (23.9)	91 (23.1)	126 (32.0)	71 (18.0)	3.38 (1.12)
I feel if I do not get vaccine the risk of getting COVID-19 will increase	20 (5.1)	62 (15.7)	57 (14.5)	121 (30.7)	134 (34.0)	3.72 (1.22)
I believe that if I do not get the vaccine, my family and relatives are more likely to get COVID 19	19 (4.8)	66 (16.8)	68 (17.3)	111 (28.2)	130 (33.0)	3.67 (1.22)
Getting COVID-19 is currently a possibility for me.	23 (5.8)	69 (17.5)	70 (17.8)	138 (35.0)	94 (23.9)	3.53 (1.19)
Perceived severity						
Complications from COVID-19 are serious	6 (1.5)	11 (2.8)	36 (9.1)	152 (38.6)	189 (48.0)	4.28 (0.85)
I am afraid of getting COVID-19	33 (8.4)	76 (19.3)	57 (14.5)	125 (31.7)	103 (26.1)	3.47 (1.29)
Perceived benefits						
Vaccination is a good idea because I feel less worried about catching COVID-19	12 (3.0)	27 (6.9)	73 (18.5)	124 (31.5)	158 (40.1)	3.98 (1.06)
Vaccination decreases my chance of getting COVID-19 or its complications	13 (3.3)	17 (4.3)	72 (18.3)	130 (33.0)	162 (41.1)	4.04 (1.03)
I believe that getting vaccinated against COVID-19 is an expression of caring for your own health	11 (2.8)	28 (7.1)	80 (20.3)	114 (28.9)	161 (40.9)	3.97 (1.07)
I believe the COVID-19 vaccine will be highly effective in preventing significant complications from the disease	13 (3.3)	26 (6.6)	97 (24.6)	121 (30.7)	137 (34.8)	3.87 (1.06)
I believe that if I am vaccinated against COVID-19, my risk of infection will be reduced	13 (3.3)	35 (8.9)	79 (20.1)	124 (31.5)	143 (36.3)	3.88 (1.09)
I believe that vaccinating against COVID-19 will reduce the risk of infecting those around me	11 (2.8)	27 (6.9)	81 (20.6)	129 (32.7)	146 (37.1)	3.94 (1.04)
Perceived barriers						
Worry that the possible side-effects of COVID-19 vaccination would interfere with my usual activities	32 (8.1)	85 (21.6)	71 (18.0)	114 (28.9)	92 (23.4)	3.37 (1.27)
I am concerned about the efficacy of the COVID-19 vaccination	18 (4.6)	72 (18.3)	72 (18.3)	129 (32.7)	103 (26.1)	3.57 (1.18)
I am concerned about the safety of the COVID-19 vaccination	23 (5.8)	71 (18.0)	68 (17.3)	126 (32.0)	106 (26.9)	3.56 (1.22)
I am concerned about the affordability of getting the COVID-19 vaccination	36 (9.1)	110 (27.9)	87 (22.1)	93 (23.6)	68 (17.3)	3.11 (1.24)
COVID-19 vaccination requires too much time and effort from my side	71 (18.0)	141 (35.8)	70 (17.8)	64 (16.2)	48 (12.2)	2.68 (1.27)
Cues to action						
I will only take the COVID-19 vaccine if I am given adequate information about it	20 (5.1)	34 (8.6)	45 (11.4)	133 (33.8)	162 (41.1)	3.97 (1.15)
I will take the COVID-19 vaccine if support for the vaccine increases on social media	19 (4.8)	44 (11.2)	60 (15.2)	130 (33.0)	141 (35.8)	3.83 (1.16)
I will only take the COVID-19 vaccine if the vaccine is taken by many in the public	58 (14.7)	102 (25.9)	82 (20.8)	87 (22.1)	65 (16.5)	2.99 (1.31)
I will receive a COVID-19 vaccine if my employer takes care of vaccination	42 (10.7)	73 (18.5)	87 (22.1)	101 (25.6)	91 (23.1)	3.31 (1.30)

Note: Data showing Health Belief Model items. Frequencies mentioned in number (n) with percentages in brackets.

TABLE 2. Associations between vaccine uptake and socio-demographic variables

Variable	Received at least one COVID-19 vaccine dose		*p*-value*
	Yes, *n* (%)	No, *n* (%)	
Sex			
Male	12 (3.0)	97 (24.6)	**0.016**
Female	65 (16.5)	216 (54.8)	
Age (years)			
18-24	13 (3.3)	187 (47.7)	**< 0.001**
25-34	19 (4.8)	69 (17.6)	
35-44	23 (5.9)	28 (7.1)	
45-54	17 (4.3)	16 (4.1)	
55-64	4 (1.0)	14 (3.6)	
≥ 65	0 (0)	2 (0.5)	
Marital status			
Married	39 (9.9)	87 (22.1)	**< 0.001**
Unmarried	27 (6.9)	195 (49.5)	
Divorce/Widow	8 (2.0)	13 (3.3)	
Other	3 (0.8)	22 (5.6)	
Educational level			
High school and below	6 (1.5)	60 (15.2)	**< 0.001**
Bachelor	27 (6.9)	191 (48.5)	
Master's/PhD	44 (11.2)	66 (16.8)	
Occupation			
Students	3 (0.8)	113 (28.7)	**< 0.001**
Unemployed	6 (1.5)	25 (6.3)	
Medical/Healthcare	17 (4.3)	28 (7.1)	
Employed in private sector	32 (8.1)	85 (21.6)	
Employed in public sector	14 (3.6)	36 (9.1)	
Other	5 (1.3)	30 (7.6)	
Monthly income (GEL)			
< 500	4 (1.0)	123 (31.2)	**< 0.001**
500-1000	18 (4.6)	94 (23.9)	
1000-1500	15 (3.8)	54 (13.7)	
> 1500	40 (10.2)	46 (11.7)	
Residence			
Urban	77 (19.5)	292 (74.1)	**0.011**
Rural	0 (0)	25 (6.3)	
Region			
Tbilisi (capital city)	72 (18.3)	255 (64.7)	**0.006**
Outside Tbilisi	5 (1.3)	62 (15.7)	
Household size			
1 person	12 (3.2)	51 (13.6)	0.746
2-3 persons	36 (9.6)	138 (36.7)	
4 or more persons	24 (6.4)	115 (30.6)	
Had experience with COVID-19			
Yes	18 (4.6)	104 (26.4)	**0.009**
No	55 (14.0)	16 8 (42.6)	
I do not know	4 (1.0)	45 (11.4)	
Had a chronic disease			
Yes	4 (1.0)	26 (6.6)	0.372
No	73 (18.5)	291 (73.9)	
Perceived overall health			
Very good	21 (5.3)	61 (15.5)	0.385
Good	39 (9.9)	166 (42.1)	
Fair	15 (3.8)	75 (19.0)	
Poor	1 (0.3)	13 (3.3)	
Very poor	1 (0.3)	2 (0.5)	

**Significant p-values are shown in bold.*

TABLE 3. Reliability results of the health belief model scales and preventive measures

Scale	Number of items	Cronbach's α
Perceived susceptibility	4	0.812
Perceived severity	2	0.547
Perceived benefits	6	0.964
Perceived barriers	5	0.822
Cues to action	4	0.688

respondents would report that they received the vaccine. The model contained five independent variables of Health Belief Model constructs (perceived susceptibility, severity, benefits, barriers and cues to action). The full model containing all predictors was statistically significant, χ^2 (df 5, N = 394) = 131.159, $p < 0.001$, indicating that the model was able to distinguish between respondents who reported versus did not report vaccine uptake. The model as a whole correctly classified 80.5% of cases. As shown in Table 4, only three independent variables made a unique statistically significant contribution to the model (perceived benefits, barriers and cues to action). The strongest predictor of reporting COVID-19 vaccine uptake was perceived benefits, recording an odds ratio of 6.18. This indicated that the odds were 6.18 times greater among those respondents who had received the vaccine than those who had not received it yet.

We further used the method of standard multiple regression analysis with HBM covariates as predictors and COVID-19 vaccine uptake as an effect variable. Results of the regression analyses for the effects of COVID-19 vaccine uptake on predictability are summarized in Table 5.

The regression results (Table 5) show that our model explains 26.7% of the variance in COVID-19 vaccine uptake (adjusted R^2 = 0.267).

DISCUSSION

This is the first study in Georgia to investigate the role of the HBM framework and social-demographic factors in preventive health behaviors, and individual difference in the acceptance of the COVID-19 vaccine. The present study examined uptake of the COVID-19 vaccine depending on the use of the HBM. Some of the most common barriers for not receiving the COVID-19 specific vaccine, associated with efficacy and safety of the existing vaccine (in the study period in the country vaccines were available from 3 different manufacturers – Oxford/Astra-Zeneca, Sinopharm and Sinovac Biotech Co., Ltd) [8]. This indicates that efficacy and safety barriers are prevalent in this population and should be investigated further to aid in the development of intervention. For example, investing more resources in information campaigns or improving access to adequate information to the public is important [23]. In addition, the HBM categories of cues to action, general barriers, and benefits were found to be significantly related to COVID-19 vaccine acceptance. These findings are consistent with other studies finding barriers [16, 18] to be significantly related to vaccine acceptance. International experience and research demonstrate that only informing or individual interventions are not effective in overcoming vaccination barriers and that different strategies

TABLE 4. Health Belief Model (HBM) predictors of vaccine uptake (at least one dose), binary logistic regression analysis

Variable	OR (95% CI)	Wald test	df	*p*-value*
Constant	–	22.13	1	< 0.001
Perceived susceptibility	1.02 (0.620-1.695)	0.009	1	0.922
Perceived severity	1.54 (0.936-2.532)	2.89	1	0.089
Perceived benefits	6.18 (3.237-11.800)	30.47	1	**< 0.001**
Perceived barriers	0.52 (0.368-0.748)	12.72	1	**< 0.001**
Cues to action	0.56 (0.369-0.850)	7.42	1	**0.006**

**Significant p-values (p < 0.05) are shown in bold.*

TABLE 5. Variables predictive for COVID-19 vaccine uptake by regression analysis

Dependent variable	Model	B	SE	β	*t*
COVID-19 vaccine uptake	Constant	0.013	0.105	–	0.122
	Perceived susceptibility	0.004	0.026	0.011	0.170
	Perceived severity	0.052	0.025	0.118	2.090
	Perceived benefits	0.147	0.025	0.361	5.881
	Perceived barriers	–0.100	0.021	–0.243	–4.868
	Cues to action	–0.077	0.023	–0.173	–3.335

and approaches must be integrated and combined [26]. Further investigation of this specific barrier will aid understanding vaccine acceptance and in the development of future vaccine interventions and campaigns in the country of Georgia.

In terms of social and demographic factors, this study shows that COVID-19 vaccination status among respondents was significantly associated with the following variables: sex, age, marital status, academic degree, occupation, average monthly income and place of residence. Furthermore, one more statistically significant factor was previous experience with COVID-19. Another study conducted among United States residents reported that vaccine acceptance varies depending on demographic factors [21, 27].

A cross-sectional online survey with the general population in Israel on predicting intention to receive a COVID-19 vaccine among the general population using the Health Belief Model found that perceived benefits, cues to action, and perceived severity were the most significant predictors of the intention to receive a COVID-19 vaccine [16]. However, another survey study suggested that perceived benefits and perceived barriers did not play a significant role in predicting the desire to receive COVID-19 vaccinations [21]. Regarding cues to action, significant predictors in our study which increased the intention to take the COVID-19 vaccine were provision of adequate information and increased support from social media campaigns. Finally, further investigation is needed regarding the differences in social factors between acceptance of vaccinations and other preventative health behaviors.

The current study has strengths and limitations. It was the first of its kind to evaluate vaccination acceptance using the HBM model and its predictors among the population in Georgia. However, there were several limitations that need to be considered when interpreting the results of this study. First of all, the use of non-probabilistic sampling technique due to the online survey methodology used may affect the generalizability of the results [28]. The use of social media (Facebook) to advertise and share the survey link among certain social media application users may affect sample selection bias due to the non-representative population, for example, by excluding those without internet access who may have different attitudes. The major effect of the non-probabilistic sampling was substantial over-representation of females in the study sample (with 71.3% of the study sample being women vs. 53% in the general population census of Georgia data in 2014) [29]. It is notable that adults of the 18-64 age group are over-represented in this survey sample, while older adults aged 65 and above are under-represented. Among other demographic data, regarding education level, subgroups of Bachelor/Master/PhD degree respondents were also significantly over-represented, with 83.2% (vs. census data 26.7%). There was also significant over-representation of respondents from Tbilisi compared with census data (53% difference) and from urban region (36.5% difference) [29]. A second limitation was the cross-sectional design, which precludes confirmation of causal relationships between social demographic characteristics, constructs of HBM and the COVID-19 vaccination status. Third, the current study used self-reported measures, which may be subjective and linked to current mood and emotions at the specific time of survey completion. It is also known as self-reporting bias. Fourth, we present unadjusted findings only. The bivariate relationship between independent and dependent variables does not control for confounders. These findings suggest a potential for bias due to confounding. We did not include in the regression analysis any of the social-demographic characteristics and focused only on HBM domains. Although one of the domains of the HBM had a low Cronbach alpha value, it might be due to the low number of questions (only 2 items were included) [30]. However, both of the items ("Complications from COVID-19 are serious" and "I am afraid of getting COVID-19") are strongly related to each other. The model is unadjusted due to the small size of the dataset. However, further data collection and analysis are recommended to compare unadjusted measures of association with confounder-adjusted estimates and judge by how much, and in what direction, they changed. Finally, due to the use of an online convenience sampling approach, we used a relatively brief survey questionnaire, which made more in-depth data collection impossible.

CONCLUSIONS

Our up-to-date survey in Georgia provides an initial snapshot on the willingness of the general public to vaccinate against COVID-19. Our results show that while some Georgian adults were open to receive a COVID-19 vaccine, acceptance of vaccination varies according to socio-demographic and behavioral characteristics such as sex, age, marital status, occupation, educational level, high perceived benefits and cues to action. Further research on this is recommended to substantiate our findings, most notably by conducting a nationally representative random sampling survey. These findings are important for policy actors and stakeholders to better guide COVID-19 vaccine national deployment plan.

Our analysis revealed that reducing barriers and making it simpler to be vaccinated will increase vaccination uptake in the general public. Hence, policymakers must consider the evidence when deciding which initiatives should be adopted. In addition, further studies are required in order to fill this knowledge gap and to better evaluate implemented policy interventions.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTIONS

MN, TL, GB prepared the concept of the paper. MN, IM collected and analysed data. MN wrote the article. All authors have given their final approval to the final version of the paper.