Predictors of intention to vaccinate against COVID-19 in a sample of Romanian adults

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Abstract: Vaccination against COVID-19 is considered to be one of the most effective ways to control and ultimately end the pandemic. Seeing that the many people are still vaccine hesitant, it is important to examine the factors which influence one's intention to vaccinate. A sample consisting of 473 Romanian adults aged between 18 and 76 years old (M = 38.01, SD = 11.27) participated in a study which investigated general anti-vaccination attitudes, conspiracy beliefs, and Health Belief Model variables as predictors of vaccination intent. Results suggest that intention to vaccinate is negatively correlated with anti-vaccination attitudes, conspiracy beliefs about the virus, and perceived barriers, while being positively correlated with perceived susceptibility, perceived severity of the disease and perceived benefits of vaccination. Moreover, intention to vaccinate was positively correlated with cues to action from doctors, but not from mass-media. A hierarchical regression model showed that perceived benefits of vaccination, perceived barriers, conspiracy beliefs about the virus, cues to action from medical staff, and being diagnosed with COVID-19 were significant predictors of participants' intention to vaccinate. Moreover, our findings indicate that there are significant differences between male and female participants on many of the investigated variables. Results are discussed in the light of previous literature.

Keywords: Intention to vaccinate, COVID-19, Health Belief Model, Conspiracy beliefs, Anti-vaccination attitudes

Introduction

The COVID-19 pandemic has had considerable negative consequences. The total number of COVID-10 related deaths has exceeded 4.5 million from its outbreak until September 2021 (Word Health Organization, 2021). The crisis has also taken a toll on the world's economy, especially on commercial and tourism industries (Jones et al., 2021). Besides health and economic concerns, anxiety,

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depression and stress related to the COVID-19 pandemic (Paulino et al., 2020) are strong arguments that support the need to control the spread of the virus.

The development and production of several vaccines against COVID-19 offer promising results in the fight against the pandemic (Mallapaty, 2021). However, the rate of vaccination is severely reduced not only by technical factors such as distribution delays and slow production (Guarascio, 2021; Villarreal, 2021), but also by psychological factors. General negative attitudes toward vaccination (Martin & Petrie, 2017), conspiracy beliefs (van Prooijen & Douglas, 2018), and beliefs related to the specific threat represented by a virus (Rosenstock et al., 1988) have already proven to reduce vaccination intent (with respect to other viruses).

Previous literature suggests that general attitudes toward vaccination predict intentions to receive future vaccines, either for oneself, or for one's children (Martin & Petrie, 2017). Moreover, in the past year, studies showed that vaccination beliefs are related to intention to receive or reject the vaccine against COVID – 19 in various countries: UK (Sherman et al., 2020), USA and Canada (Taylor et al., 2020) or Italy (Graffigna et al., 2020).

Besides general attitudes toward vaccination, specific beliefs regarding the threat posed by the COVID-19 virus should be taken into consideration. One of the most relevant theoretical models that address these aspects is the Health Belief Model (HBM) (Rosenstock et al., 1988). This model argues that there are three main groups of factors that influence health relevant behavior: i) the existence of a health concern (the motivation to stay healthy); ii) the existence of a health threat (the belief that one is vulnerable to a health problem), and iii) the belief that a certain way of action would reduce the perceived threat. Otherwise put, people's perception that they are susceptible to a certain heath threat, their perception that the illness or its consequences are severe, and the perception of the costs and benefits of a certain way of action represent factors that influence the adherence to a behavior (Rosenstock et al., 1988).

So far, several studies investigated the relation between the main variables of HBM and intention to vaccinate against COVID – 19. Perceived susceptibility and perceived severity have been two of the most frequently investigated factors in empirical studies.

Perceived susceptibility to being infected with the new virus was found to be positively related to vaccination intention in studies conducted in many countries: USA (Head et al., 2020; Reiter et al., 2020), Italy (Caserotti et al., 2021; Graffigna et al., 2020), Israel (Dror et al., 2020), China (Wang et al., 2020), Malaysia (Wong et al., 2020), UK and Turkey (Salali & Uysal, 2020), France (Ward et al., 2020), or Germany (Glöckner et al., 2020). As far as we know, only one study, conducted in Australia at an early point of the pandemic (Faasse &

Newby, 2020), found no relation between the perceived likelihood to be infected with the coronavirus and participants' intention to vaccinate.

Results regarding perceived severity are more nuanced. In the same Australian study mentioned above (Faasse & Newby, 2020), perceived severity of COVID-19 infection was not a significant predictor of intention to vaccinate. Most studies found that perceiving the consequences of COVID-19 as being severe significantly correlated with participants' intention to vaccinate (Glöckner et al., 2020; Head et al., 2020; Reiter et al., 2020; Williams et al., 2020). However, the relation between these variables seems to depend on the way severity was measured. Head et al. (2020) found that the belief that the coronavirus represented a threat to physical health, and the belief that the virus was a major problem for the community were positively associated with higher intention to vaccinate, but mean perceived severity of COVID-19 was not. In Finland, only the general severity of the disease was found to be significantly related to the intention to vaccinate against COVID, but not more specific evaluations of the virus severity (threat to physical health or the belief that the virus increased likelihood to die) (Karlsson et al., 2021).

The perceived benefits of receiving a vaccine were found to be strong correlates of the intention to be vaccinated (Mercadante & Law, 2021; Reiter et al., 2020; Wong et al., 2020). For example, Wong et al. (2020) found that believing that vaccination decreases the chance of infection and health related worries were the main benefits of vaccine intake.

Several perceived barriers that reduce the intention to vaccinate against COVID-19 were analyzed (Mercadante & Law, 2021; Williams et al., 2020). Some of the most frequently investigated barriers were represented by concerns about vaccine safety (such as unforeseen side effects) and mistrust of vaccine benefits (Paul et al., 2021). However, we need to take into consideration the fact that, at least in the early stages of pandemic, there were limited data related to COVID-19 vaccines, so the respondents were not able to search and collect relevant information in order to evaluate these barriers (Kwok et al., 2021).

Social cues to vaccinate were also investigated. For example, in Australia, closely following media coverage predicted higher vaccination intentions (Faasse & Newby, 2020). Moreover, higher vaccination intentions were predicted by confidence in government information (Faasse & Newby, 2020), by using traditional and authoritative sources of information (Murphy et al., 2021), and valuing doctor's recommendation (Wang et al., 2020).

Mistrust of vaccine benefits and, consequently, intention to vaccinate against COVID-19, may be related to people's tendency to adhere to conspiracy beliefs. In stressful situations, conspiracy theories help people make sense of what is happening to them, thus reducing the anxiety felt in such situations (Douglas et al., 2017). The COVID-19 pandemic is such an anxiety - provoking situation,

where people do not feel in control. Conspiracy theories can be defined as attempts to identify the cause of various events as plots conducted by secret and powerful groups, rather than natural phenomena or events caused by transparent actions (Oleksy et al., 2021). Even when conspiracy beliefs are very unlikely to be true, they influence various life dimensions such as health, interpersonal relationships, and safety (van Prooijen & Douglas, 2018).

Anti-vaccination beliefs seem to be part of a psychological tendency to believe in conspiracies (Goldberg & Richey, 2020). Anti-vaccine conspiracy theories make people doubt the safety of a vaccine, increase their feelings of powerlessness and disillusionment, whilst decreasing their trust in authorities. Consequently, believing in vaccination conspiracy theories is negatively related to vaccination intentions, be it a COVID-19 vaccine (Bertin et al., 2020; Taylor et al., 2020) or another type of vaccine (Jolley & Douglas, 2014; Shapiro et al., 2016). On the other hand, believing in the natural origin of the virus increased the chances of accepting the COVID – 19 vaccine (Salali & Uysal, 2020).

Some demographic variables were quite consistently studied in relation with COVID-19 vaccination intention. For example, although several studies found no gender differences in the vaccination intention (Faasse & Newby, 2020; Sherman et al., 2020), many studies found women to be more reluctant to vaccination than men (Detoc et al., 2020; Karlsson et al., 2021; Paul et al., 2021; Salali & Uysal, 2020; Wang et al., 2020; Ward et al.; Wong et al., 2020). Moreover, older age is associated with greater COVID-19 vaccine acceptance (Al-Mohaithef & Padhi, 2020; Detoc et al., 2020; Faasse & Newby, 2020; Mercadante & Law, 2021; Sherman et al., 2020; Ward et al., 2020).

Romania, as a member of European Union, benefits from EU support in order to achieve the desired vaccination rates. However, 39.4% of Romanians do not intend to get vaccinated (Chirileasa, 2021). Some recent news regarding the adverse effects of one of the approved vaccines has stirred spirits and negatively influenced vaccination rates (Chirca, 2021). Therefore, it is important to conduct empirical studies aimed at understanding which factors influence one's intention to vaccinate against COVID-19. Such research might serve as a base of knowledge on which to build evidence-based health policies.

Consequently, the main aim of the present paper was to identify the significant predictors of vaccination intent among Romanian respondents. We anticipated that general attitudes toward vaccination, dimensions of HBM (perceived susceptibility, perceived severity, perceived benefits and barriers and cues to action), and conspiracy beliefs are significant predictors of intention to vaccinate against COVID-19 among Romanian respondents, when we control the impact of demographic and health-related variables. More specifically, we expected that negative attitudes toward vaccination, conspiracy beliefs and perceived barriers to be negatively related to vaccination intent, while perceived

susceptibility, perceived severity, perceived benefits and cues to action to be positively related to vaccination intent.

Method

Participants

The sample consisted of 473 participants, aged between 18 and 76 years old, with a mean age of 38.01 (SD = 11.27). Out of these, 57.3% were females and 26.2% were males. The remaining 16.5% of the participants did not disclose their gender.

Measures

Vaccination Attitude Examination (VAX) Scale (Martin & Petrie, 2017) is a 12-item questionnaire assessing participants' negative attitudes towards vaccination in general. The instrument contains four subscales, namely Mistrust of vaccine benefit (e.g., "*I can rely on vaccines to stop serious infectious diseases*"), Worries about unforeseen future effects (e.g., "*Although most vaccines appear to be safe, there may be problems that we have not yet discovered*"), Concerns about commercial profiteering (e.g., "*Authorities promote vaccination for financial gain, not for people's health*"), and Preference for natural immunity (e.g., "*Being exposed to diseases naturally is safer for the immune system than being exposed through vaccination*"). Participants rated their response on a 7-point scale (1 = Strongly disagree; 7 = Strongly agree). Due to inattention, one item from the original instrument ("*I feel safe after being vaccinated*") was omitted. Internal consistency for all of the subscales was very good, α = .892 - .908.

Participants' *conspiracy beliefs* about the virus were assessed using *four items concerning the origin and effects of COVID-19* (α = .730). The items are presented in Table 1.

Table 1. Items used to measure conspiracy beliefs about the virus and HBM variables

COVID-19 Conspiracy Beliefs	1. COVID-19 is a biological weapon used in the war between the great powers. 2. COVID-19 is an ordinary virus, but exaggerated by the media and politicians. 3. COVID-19 was artificially developed, but it sprang out of control. 4. COVID-19 is a common virus, but used for hidden purposes by certain economic or political forces.
Health Belief Model	1. It's very likely that I'll become infected with COVID-19 in the near future. (Perceived susceptibility)

2. I'd be very sick if I had COVID-19. (Perceived severity)
3. COVID-19 vaccinations effectively protect against me against the disease. (Perceived benefits)
4. I`m concerned about the potential side effects of the COVID-19 vaccine. (Perceived barriers)
5. I'd vaccinate against COVID-19 if my doctor recommended me to. (Cues to action – doctor)
6. The recommendations in the mass media affect my decision whether to vaccinate against COVID-19. (Cues to action – media)

Each key *Health Belief Model* variable was assessed using one item. We also measured cues to action using two items (mass media campaigns/ doctor recommendation) (see Table 1).

Participants' intention to vaccinate was also measured using one item ("*When the COVID-19 vaccine is available in our country, I am planning to get vaccinated*"; 1 = Strongly disagree; 7 = Strongly agree).

Participants were asked to rate their *health condition* on a 5-point scale (1 = Poor; 5 = Excellent). They also indicated whether or not they (1) had chronic illnesses, (2) were confirmed positive for COVID-19, and (3) had a relative/ a friend who tested positive for COVID-19.

Procedure

Approval for the study was obtained from the institutional Research Ethics Committee. Participants were recruited online. Some of them had previously taken part in another research concerning the psychological effects of the pandemic and had consented to also participate in a study investigating their intention to vaccinate against COVID-19. Therefore, they were contacted via email. The rest of the participants were recruited through Facebook groups and by using a snowballing technique. Written informed consent was obtained from all participants before the start of the study. Anonymity of participants' information was guaranteed.

Results

Preliminary analysis

Descriptive statistics for the main study variables are presented in Table 2. Participants were generally satisfied with their health condition (M = 3.49, SD = .84). Approximately 83% of the participants reported that they did not have any chronic illness. Only 13.1% had been previously diagnosed with COVID-19, but 87% knew a friend or a relative who tested positive for COVID-19. Before

proceeding with the main analyses, we tested whether the socio-demographic and health variables we took into account had an influence on any of the key variables included in the study. As detailed in Table 3, we found that there were significant differences between male and female participants regarding their intention to vaccinate, with men reporting a higher intention to vaccinate than women. Women were also more susceptible to conspiracy theories about the virus than men. Moreover, female participants had more negative attitudes towards vaccination than men. Men and women also scored differently on some HBM variables (see Table 3).

Table 2. Descriptive statistics for the main study variables

Variable	M	SD
Intention to vaccinate	4.48	2.36
VAX Scale total (Anti-vaccination attitudes)	29.68	13.98
Mistrust of vaccine benefit	4.46	2.94
Worries over unforeseen future effects	9.79	5.02
Concerns about commercial profiteering	7.59	4.47
Preference for natural immunity	7.83	4.39
Health belief model		
Perceived susceptibility	3.53	1.83
Perceived severity	2.95	1.61
Perceived benefits	4.30	2.13
Perceived barriers	4.47	2.04
Cues to action – mass-media	4.10	2.01
Cues to action – doctors	3.97	2.17
Conspiracy beliefs about the virus	8.59	3.76

Table 3. Significant differences between male and female participants

Variable	Men M (SD)	Women M (SD)	$t(393)$
Intention to vaccinate	5.17 (2.12)	4.27 (2.38)	3.77[***]
Anti-vaccination attitudes	28.24 (13.34)	32.37 (14.90)	-2.75[*]
Perceived benefits of vaccination	4.95 (1.97)	4.03 (2.14)	4.07[***]
Perceived barriers	3.57 (1.95)	4.80 (1.95)	-5.82[***]
Cues to action - doctors	4.29 (2.25)	3.75 (2.14)	2.27[*]
Belief in conspiracy theories about the virus	7.58 (3.27)	8.74 (3.63)	3.04[*]

Note. [***] $p < .001$, [**] $p < .01$, [*] $p < .05$

We also tested whether having had COVID-19 has an effect on any of the study variables. Results show that participants who were tested positive for COVID-19 (M = 3.06, SD = 2.36) estimated that they are less likely to become infected with the virus in the future than participants who did not have COVID-

19 (M = 3.60, SD = 1.73), but the difference was only marginally significant, t(471)= 1.72, p = .089. Moreover, compared with participants who tested positive for COVID-19 (M = 2.53, SD = 1.67), participants who did not have COVID-19 (M = 3.01, SD = 1.60) considered to a larger extent that the infection would have serious consequences on their health, t(471) = 2.21, p = .027. Participants who were positive for COVID-19 were also less likely to believe in conspiracy theories (M = 7.59, SD = 2.80), when compared with participants who did not (M = 8.74, SD = 3.86), t(471) = 2.84, p = .005. Participants who had family members or friends diagnosed with COVID-19 estimated that they are more susceptible to become infected with the virus in the near future (M = 3.72, SD = 1.83) when compared to the rest of participants (M = 2.70, SD = 1.63), t(471) = 4.88, p < .001. Participants who personally knew someone who was found positive for COVID-19 also believed to a greater extent that COVID-19 vaccination is an effective measure against the disease (M = 4.41, SD = 2.06), when compared with the rest of the sample (M = 3.81, SD = 2.35), t(471) = 2.23, p = .027. Participants who reported having chronic illnesses (M = 3.67, SD = 2.02) estimated that they were more likely to become very sick if they get infected with COVID-19, when compared with participants who did not report having chronic illnesses (M = 2.81, SD = 1.48), t(471) = -3.58, p < .001. There was a positive correlation between age and anti-vaccination attitudes (r = .149, p = .003), but age was not associated with intention to vaccinate.

Correlations among intention to vaccinate and key study variables

Pearson Correlations were computed in order to assess the relation between Intention to vaccinate was negatively correlated with all VAX subscales, showing larger correlations with Mistrust of vaccine benefit and Concern about commercial profiteering. All but one (cues to action – media) HBM variables were associated with participants' intention to vaccinate. Moreover, we found a negative correlation between conspiracy beliefs about the virus and participants' intention to get the COVID-19 vaccination. Complete results are presented in Table 4.

Table 4. Correlation among the intention to vaccinate, VAX subscales and HBM variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Intention to vaccinate											
VAX Scale											
2. Mistrust of vaccine benefit	-.45***										
3. Worries over unforeseen future effects	-.21***	.47***									
4. Concerns about commercial profiteering	-.40***	.59***	.65***								
5. Preference for natural immunity	-.33***	.52***	.53***	.68***							
Health belief model											
6. Perceived susceptibility	.15**	-.09	.03	-.07	-.03						
7. Perceived severity	.24***	-.13**	-.04	-.09*	-.08	.37**					
8. Perceived benefits	.76***	-.48***	-.22***	-.44***	-.33***	.28**	.27***				
9. Perceived barriers	-.54***	.30***	.28***	.35***	.27***	.04	.03	-.40***			
10. Cues to action – mass-media	.05	-.04	.03	.01	-.01	.11*	.07	.13**	.09*		
11. Cues to action – doctors	.46***	-.23***	-.09	-.23***	-.15**	.19***	.18***	.47***	-.18***	.27***	
12. Conspiracy beliefs about the virus	-.56***	.28***	.13**	.35***	.28***	-.08	-.21***	-.48***	.36***	.05	-.22***

Note. *** $p < .001$, ** $p < .01$, * $p < .05$ (two-tailed)

37

Regression model

In order to gain a better understanding of the factors that influence one's intention to vaccinate against COVID-19, we ran a hierarchical regression analysis (see Table 5). Socio-demographic and health variables were entered in Step 1. Together, they accounted for 4.5% of the variation in the dependent variable. However, only gender (β = -.174) was a significant predictor of participants' intention to vaccinate. Adding general attitudes towards vaccination and conspiracy beliefs about the virus to the model explained an additional 40% of the variation in participants' intention to vaccinate. Gender was no longer a significant predictor of the dependent variable. Conspiracy theories about the virus, mistrust of vaccine benefit, as well as having tested positive for COVID-19 were significant predictors of participants' intention to vaccinate in Step 2. Entering HBM variables explained an additional 25.8% of the variation in the dependent variable. The final model included the following significant predictors: perceived benefit (β = .505), perceived barriers (β = -.232), conspiracy beliefs about the virus (β = -.158), cues to action (β = .124), and being diagnosed with COVID-19 (β = -.092). It accounted for 70.3% in the variation of participants' intention to vaccinate.

Discussions

By conducting the present study, we aimed to investigate the variables that predict Romanians' intention to vaccinate. Our results indicate gender differences on most variables included in the study. These results are consistent with the majority of the studies conducted so far (e.g., Detoc et al., 2020; Karlsson et al., 2021; Paul et al., 2021) that also indicate that women reported a lower intention to vaccinate against COVID-19 than men. Further on, women reported stronger general anti-vaccination attitudes and stronger beliefs in conspiracy theories. One possible explanation may be related to the fact that women conduct more online search for health information than men (Hallyburton & Evarts, 2014; Stern et al., 2012), and to the fact that there is a lot on anti-vaccination content on-line (Meleo-Erwin et al., 2017; Ortiz et al., 2019; Smith & Graham, 2017). For example, analyzing anti-vaccination movement on Facebook, Smith and Graham (2017) found a discourse centered on vaccination conspiracy theories related to oppression by governmental institutions. They also found that the vast majority of participants on these Facebook anti-vaccination pages were women.

Table 5. Result of the hierarchical regression predicting intention to vaccinate

Predictors	Step 1			Step 2			Step 3		
	B	SE B	β	B	SE B	β	B	SE B	β
Age	-.01	.01	-.01	.01	.01	.05	.01	.01	.01
Gender (1=female)	-.87***	.26	-.17	-.21	.20	-.04	.21	.15	.04
Self-reported health status	-.20	.15	-.07	-.09	.11	-.03	-.17	.09	-.06
Chronic illnesses (1 = yes)	.13	.34	.02	-.03	.27	-.01	-.09	.20	-.01
Tested positive for COVID-19 (1 = yes)	-.33	.34	-.05	-.69*	.27	-.10	-.62*	.20	-.09
Friends or family tested positive for COVID-19 (1 = yes)	.48	.31	.08	.24	.24	.04	.14	.18	.02
Mistrust of vaccine benefit				-.20***	.04	-.27	-.05	.03	-.06
Worries over unforeseen future effects				-.01	.02	-.01	-.01	.02	-.01
Concerns about commercial profiteering				-.05	.03	-.10	.02	.02	.05
Preference for natural immunity				-.04	.03	-.07	-.03	.02	-.06
Conspiracy beliefs about the virus				-.25***	.03	-.38	-.10***	.02	-.16
Perceived susceptibility							-.04	.04	-.03
Perceived severity							.03	.05	.02
Perceived benefits							.55***	.05	.51
Perceived barriers							-.27***	.04	-.23
Cues to action – mass-media							-.02	.04	-.02
Cues to action – doctors							.13*	.04	.12
F	3.07*			27.96***			52.55***		
ΔR^2				.40			.25		
ΔF				55.23***			54.59***		

Note. $^{***} p < .001$, $^{*} p < .05$

Having been infected with COVID-19, or having infected acquaintances, has a significant effect on several variables. Respondents who were tested positive for COVID-19 considered that they were less likely to become infected with the virus in the future than participants who did not have COVID-19. It is possible that they responded thinking of the natural immunity gained after such an infection. Participants who tested positive for COVID-19 were also less likely to believe in conspiracy theories than participants who did not - probably because

they had experienced the symptoms associated with the disease and know that the threat is real. Compared with participants who tested positive for COVID-19, participants who did not have COVID-19 considered to a larger extent that the infection would have serious consequences on their health.

Participants who have family members or friends diagnosed with COVID-19 estimated that they are more susceptible to become infected with the virus in the near future and also believed that COVID-19 vaccination is an effective measure against the disease, when compared with the rest of the sample. These results may be explained by the fact that people who have acquaintances, friends or relatives who were infected with COVID-19 experience more anxiety, stress and depression (Cao et al., 2020; Mazza et al., 2020).

Participants who reported having chronic illnesses estimated that they were more likely to become very sick if they got infected with COVID-19, when compared with participants who did not report having chronic illnesses. This result was to be expected, considering the fact that various medical organizations have been stressing the fact that certain chronic illnesses increase the severity of COVID-19 symptoms.

There was a positive correlation between age and anti-vaccination attitudes, but age was not associated with intention to vaccinate. Consequently, we were unable to replicate the results reported by previous studies, which found that older age is associated with greater COVID-19 vaccine acceptance (e.g., Al-Mohaithef & Padhi, 2020; Detoc et al., 2020; Faasse & Newby, 2020).

As indicated by previous research, intention to vaccinate was negatively correlated with all dimensions of anti-vaccination attitudes (Graffigna et al., 2020; Sherman et al., 2020; Taylor et al., 2020), as well as with conspiracy beliefs about the virus (Bertin et al., 2020; Taylor et al., 2020). Almost all HBM variables were associated with participants' intention to vaccinate. Only cues to action received from the media did not correlate with vaccination intention. One possible explanation is the fact that, in Romania, the media messages related to vaccination have been mixed: some support anti-COVID-19 vaccination, some argue against it.

In the final step of the regression model, perceived benefits of being vaccinated, perceived barriers to vaccination, conspiracy beliefs about the virus, cues to action from medical staff, being diagnosed with COVID-19 were the strongest predictors of intention to vaccinate against this virus. This result suggests some lines of action that could be followed in order to increase vaccination adherence. For example, the content of the persuasive messages should focus on the benefits of vaccination and on how to easily overcome vaccination barriers. Medical specialists should be frequently involved in transmitting such messages. Moreover, people who were infected and experienced the symptoms of the virus can bring personal information about their experiences,

supporting the medical and governmental staff in their fight against the conspiracy beliefs related to COVID-19 virus.

Despite the fact that the present research highlights some important predictors of vaccination intentions against COVID-19 in a sample of Romanian participants, it is not without limitations. Firstly, we did not use a representative sample, which explains why participants' intention to vaccinate was relatively high in our study. Therefore, generalization of the results is not possible. Secondly, we could have collected more socio-demographical information about the participants, in addition to age and gender. This would have allowed us to investigate whether other variables, such as education or income, have an impact on one's intention to vaccinate, as suggested by previous studies (e.g., Al-Mohaithef & Padhi, 2020; Head et al., 2020; Mercadante & Law, 2021; Reiter et al., 2020). Moreover, for practical reasons, we only included one item for each variable described by the HBM. Consequently, for example, in our research perceived barriers referred to participants' perceptions that the vaccine might be dangerous (i.e., perceived side effects). However, perceived access barriers might also play an important role in a person's decision to vaccinate (e.g., Wong et al., 2021). Furthermore, it is important to also note that the cross-sectional design of our study does not allow us to make strong causal inferences. Last but not least, intention to vaccinate is not always a strong predictor of vaccination uptake (Liao et al., 2011). Therefore, future studies might benefit from using longitudinal designs and measuring actual vaccination behavior.

Conclusion

The present study investigated conspiracy beliefs and HBM variables as predictors of vaccination intentions against COVID-19 in a sample of Romanian participants. In agreement with existent literature, we found that perceived vaccination benefit, perceived side effects and conspiracy beliefs about the virus are the most important factors that influence one's intention to take the vaccine. These results can be used by authorities to design effective public information campaigns aimed at increasing vaccination rates.

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