




## Article

# Who Believes in Conspiracy Theories about the COVID-19 Pandemic in Romania? An Analysis of Conspiracy Theories Believers' Profiles

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**Abstract:** The current COVID-19 pandemic has been accompanied by the circulation of an unprecedented amount of “polluted” information, especially in the social media environment, among which are false narratives and conspiracy theories about both the pandemic and vaccination against COVID-19. The effects of such questionable information primarily concern the lack of compliance with restrictive measures and a negative attitude towards vaccination campaigns, as well as more complex social effects, such as street protests or distrust in governments and authorities in general. Even though there is a lot of scholarly attention given to these narratives in many countries, research about the profile of people who are more prone to believe or spread them is rather scarce. In this context, we investigate the role of age, compared with other socio-demographic factors (such as education and religiosity), as well as the role of the media (the frequency of news consumption, the perceived usefulness of social media, and the perceived incidence of fake information about the virus in the media) and the critical thinking disposition of people who tend to believe such misleading narratives. To address these issues, we conducted a national survey ( $N = 945$ ) in April 2021 in Romania. Using a hierarchical OLS regression model, we found that people who perceive higher incidence of fake news ( $\beta = 0.33, p < 0.001$ ), find social media platforms more useful ( $\beta = 0.13, p < 0.001$ ), have lower education ( $\beta = -0.17, p < 0.001$ ), and have higher levels of religiosity ( $\beta = 0.08, p < 0.05$ ) are more prone to believe COVID-19-related misleading narratives. At the same time, the frequency of news consumption (regardless of the type of media), critical thinking disposition, and age do not play a significant role in the profile of the believer in conspiracy theories about the COVID-19 pandemic. Somewhat surprisingly, age does not play a role in predicting belief in conspiracy theories, even though there are studies that suggest that older people are more prone to believe conspiracy narratives. As far as media is concerned, the frequency of news media consumption does not significantly differ for believers and non-believers. We discuss these results within the context of the COVID-19 pandemic.

**Keywords:** conspiracy theories; COVID-19 pandemic; digital disinformation; religiosity; fake news incidence



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## 1. Introduction

The worldwide pandemic that started two years ago has led, among other things, to a surge in news consumption and an increased demand for up-to-date, accurate (online) content about coronavirus and the social, economic, political, even psychological implications it has triggered globally. However, while COVID-19-related information is relatively easy to spot in both mainstream media and on various social platforms, an impressive amount of that information is, in fact, misleading, conspiracy-driven, or outright false [1,2]. In earlier studies, the parallel “infodemic” accompanying the original epidemic has been compared to the SARS-CoV-2 virus's intra-community transmission [3], giving rise to numberless rumors, misleading facts, and fake news regarding the coronavirus situation

that have constantly circulated online and that show no sign of halting soon. Among them, conspiracy theories regarding the pandemic in general and vaccination campaigns aimed at containing the virus have become particularly commonplace in the digital ecosystem [4]. Ranging from stories denying the very existence of the virus to narratives claiming that its transmission is associated with the roll-out of 5G or that facemasks can cause hypoxia or hypercapnia [5], toxic narratives have proliferated and continue to be widely shared among internet users around the world and fuel confusion, uncertainty, and concern.

The effects of spreading and/ or believing in such questionable, conspiracy-based information are complex and yet to be established in the long run at both the individual and the societal level. Still, given the current context and building on previous research, we argue that these effects primarily concern an individuals' resistance to accepting protective measures [6] and a rather negative attitude towards vaccination and immunization campaigns [7,8], as well as other far-reaching effects, such as generalized panic, high levels of societal anxiety [9], street protests, or distrust in governments, mainstream politics, and official institutions [10].

In this study, we seek to examine the factors that shape the profile of the believer in conspiracy plots and narratives. As previously shown, in previous studies, the latter have been linked directly to the undermining of public health efforts [1], and, more specifically, to people's reluctance in adopting rules that could successfully contribute to herd immunity [11,12]. Here, we intend to contribute to a growing body of works documenting the factors that may lead people to believe in conspiracy theories and to act based on these beliefs. This is, to our knowledge, one of the first studies of its kind in Romania, investigating the main predictors of Romanian people's tendency to believe in conspiracy narratives related to vaccines and vaccination. One of the premises at the center of this paper is that media play a key role in the way people perceive the COVID-19 crisis and its various implications. Therefore, we developed a survey-based research design in order to assess media consumption (i.e., the frequency of news consumption from websites, SNS platforms and IM apps, the perceived usefulness of social media, and the perceived incidence of fake information about the virus in the media) and their contribution in building the profile of the believer in conspiracy theories about the COVID-19 pandemic. Furthermore, we investigated the role of age, as compared to other socio-demographic factors such as education and religiosity, and the critical thinking disposition of people who tend to embrace and ultimately disseminate such deceitful content.

It is essential to understand which types of people are more likely to believe and further proliferate misleading narratives or conspiracy theories. This helps to provide evidence-based recommendations for stakeholders such as health experts, journalists, and policy makers to raise awareness and take actions to address the dangers associated with potentially harmful information circulating as misleading narratives about COVID-19-related topics, which discourage people from complying with restrictive and protective measures.

## 2. Conspiracy Theories and Predictors of Conspiracy Beliefs

Given their nature of precariousness and unpredictability, crises are a fertile ground for conspiracy theories. Such narratives offer a "proposed explanation of events" [13] (p. 2) that is typically based on the categorization of the Other—a secret, all-powerful group, or groups of people, pursuing some malevolent purpose against the common good [14]. Their origins are to be found in people's need to build a narrative that gives them the possibility to cope with the unknown [15]. Conspiracy theories are closely connected with psychological factors, such as powerlessness [16] or anxiety and uncertainty [17]. They might also stem from people's need to restore a threatened sense of security and control [18]. They may have significant consequences at both the individual and the social level, causing real harm—see, for example, the correlation between anti-vaccine conspiracy beliefs and vaccination intentions [19]. Different factors, such as (lower) socioeconomic status [20,21], partisanship and news media exposure (often closely connected [22–24]),

conspiracy thinking and denialism [25], or personal traits [26] might explain people's tendencies to embrace conspiracy beliefs.

During the current COVID-19 health crisis, conspiracy theories are running rampant as part of a larger disinformation process channeled mainly via social media [25,27]. For example, some people believe that the COVID-19 virus is being purposefully manufactured and spread as a bioweapon; others have been persuaded that the virus is targeted against Islamic nations, that the COVID-19 vaccine is designed to implant people with microchips in order to gain control over them, or that the vaccine could cause infertility, restricting the growth of the human population [28–30]. These conspiracy beliefs can pose serious threats to public health, as they are positively correlated with people's reluctance to comply with protective measures taken by authorities [7,31].

One of the most common conspiracy theories, both in the COVID-19-related context and in other health-related crises, concerns vaccines and vaccination. Although vaccination is one of the most effective public health measures [32], vaccine criticism [33] or even an anti-vaccination movement [34] represent an issue that many countries across the globe face well into the 21st century. As emphasized by Jolley and Douglas [19], the anti-vaccine conspiracy movement is built around the argument that big pharmaceutical companies and governments conceal information about vaccine efficacy in order to pursue their own dishonest goals. Additionally, given the emergence of a postmodern paradigm of healthcare, where the power tends to be transferred from doctors to patients, and the unprecedented development of the online environment, the very legitimacy of science and the concept of expertise are being called into question, opening a discursive space in which anti-vaccine activists can exert their influence [34].

As previously mentioned, different factors might provide explanations for people's tendencies to believe in conspiracy theories and to act based on these beliefs. One of these predictors is individuals' thinking dispositions [35–37]. For example, it has been empirically demonstrated that conspiracy beliefs negatively correlate with analytic thinking, with open-mindedness, with the need for cognition [37] (p. 574), or with critical thinking. In fact, critical thinking, understood as the "reasonable reflective thinking that is focused on deciding what to believe or do" [38] (p. 46), is paramount in the case of conspiracy theories. These usually rely on ambiguity [39] and on "a series of fallacious arguments" [40] (p. 7); therefore, it is essential to discern truth from falsehood and exaggeration from mere, plausible facts. As Blair (2012) [41] or Lantian et al. (2020) [40] demonstrated, individuals who score highly in their critical thinking abilities are less inclined to believe conspiracy theories. They are more capable of critically examining information they come across and of accurately assessing the reliability and the credibility of sources. In the COVID-19 context, critical thinking is advanced by Grimes (2020) [42] as a possible solution for countering the flood of health disinformation—among which are vaccine and vaccination-related conspiracy theories—that has polluted the media ecosystem. In line with this reasoning, we posit that:

**Hypothesis 1 (H1).** *People with a lower disposition towards critical thinking are more prone to believe in conspiracy theories about vaccines and vaccination.*

Nowadays, digital media platforms have outpaced print and broadcast as sources of news [43]. This dramatic change in people's media diet raises mixed reactions. While some scholars praise the equality in information access, production, and dissemination [44] made possible by the advent of these platforms, others point out that the lack of gatekeepers, of objectivity and balance or the insufficient use of fact-checkers [45] transform them into a fertile ground for the uncontrolled spread of false content [46,47]. Additionally, within their social media networks, individuals tend to consume and disseminate ideas and information with which they already agree, without or barely taking into consideration alternative opinions [48,49]. As many scholars have already pointed out, social media plays an essential role in the dissemination of conspiracy theories [50,51]. This phenomenon is also replicated in case of the current COVID-19 pandemic, where most

of the conspiracy theories were first generated and disseminated on social media [52,53]. There is also strong evidence that supports a correlation between social media use and beliefs in conspiracy theories [23,51,54], and more specifically, between social media use and beliefs in vaccine and vaccination-related conspiracy theories [34]. A large amount of research [27,30,55] has already demonstrated that shows people who use social media as news or information sources are more prone to believe in COVID-19-related conspiracy theories, including vaccine and vaccination-related conspiracy theories. Against this backdrop, we suggest that:

**Hypothesis 2 (H2).** *People who believe that SNS are more useful for keeping them updated with any type of information are more prone to believe in conspiracy theories about vaccines and vaccination.*

As previously mentioned, the outbreak of the current pandemic was associated with a flood of disinformation, mainly spread online. Mitchell and Oliphant (2020) [56] showed that almost half of Americans declared they have been exposed to coronavirus-related misleading information (often referred to as “fake news”); nearly two-thirds reported encountering it on a daily basis, which might be problematic, given that repeated exposure can lead to an increased belief in fake news [57]. Similarly, a survey by Ofcom in the UK found that almost half of the population reported exposure to coronavirus-related fake news [58]. Previous studies have already linked fake news and conspiracy theories [59–61]. As suggested by Faragó et al. (2019) [62], conspiracy mentality, or “a political worldview consisting of general feelings of distrust or paranoia toward government services and institutions, feelings of political powerlessness and cynicism, and a general defiance of authority” [63] (p. 194) predicts the higher acceptance of political fake news. Halpern et al. (2020) [61] also showed that a conspiracy mentality, including vaccine-related conspiracy beliefs, is positively correlated with exposure to fake news, while Landrum and Olshansky (2019) [63] empirically demonstrated that conspiracy mentality predicts the rejection of science (thus opening room to beliefs such as the idea that vaccines are unsafe and can cause different health disorders). In line with this reasoning, here, we state that:

**Hypothesis 3 (H3).** *People who perceive a higher incidence of fake news related to COVID-19 vaccination are more prone to believe in conspiracy theories about vaccines and vaccination.*

In times of health crisis, people tend to consume an increasing amount of news and more frequently [64], in order to find out about possible assessments of risks and solutions to the situation. In what specifically concerns the COVID-19 crisis, different studies [30,65,66] provide empirical support for an increased popularity of mainstream media, including television and newspapers, as sources of information. Additionally, these researchers have found a strong correlation between the use of different information sources and COVID-19 beliefs. For example, the accurate perception about the gravity of the virus was higher among individuals that used and trusted official government websites; those who relied more on other sources, among which is online media, tended to downplay the importance of the outbreak or to believe false claims about the virus and its treatment [65,67,68]. Furthermore, as different authors have already demonstrated, the online environment was a major source of disinformation in general and of conspiracy theories in particular during the current pandemic [69–71]. Many of these conspiracy narratives have been built around the COVID-19 vaccine and vaccination [7,23]. This is not surprising, since the internet is a major source of vaccine and vaccination-related conspiracy theories [34,72–74] that can flourish during outbreaks and normal periods as well. Associated “with mistaken fears about the nature or effects of vaccination” [7] (p. 2), COVID-19-vaccine-related conspiracy beliefs tend to minimize the threat posed by the virus or to advance alternative ways of facing it. What is more important is that they can cause real harm, since they are positively associated with vaccine hesitancy. Against this backdrop, here, we posit that:

**Hypothesis 4 (H4).** *People who consume more COVID-19 related news from online sources (websites, SNS, and IM platforms) are more prone to believe in conspiracy theories about vaccines and vaccination.*

A relatively large body of studies has investigated the relevance of age as a possible predictor for conspiracy beliefs, and particularly for vaccine and vaccination-related conspiracy beliefs, with mixed results. For example, Thornburn and Bogart (2005) [75] or Ross, Essien, and Torres (2006) [76] did not find a significant correlation between age, conspiracy beliefs, and subsequent behavior. Nonetheless, other studies emphasized that age does predict conspiracy beliefs; more precisely, young people are more inclined to embrace such beliefs [77,78]. Recent studies investigating COVID-19-related conspiracy beliefs [7,27] provide empirical support for this finding. In fact, younger individuals, who tend to feel politically powerless (Romer and Jamieson, 2020) [7] and tend to develop less resilience to misinformation than older generations (De Coninck et al., 2021) [68], were more prone to believe COVID-19-related conspiracy theories, including vaccine-related conspiracy theories. Additionally, when compared with older generations, young people tend to consume slightly more social media [79] which, as previously shown, is more prone to disseminate conspiracy theories, including vaccine and vaccination-related conspiracy theories. This hypothesis is supported by Allington et al.'s study (2020) [27]. They showed that, among demographic variables, age was most strongly associated with vaccine hesitancy. In line with this reasoning, here, we state that:

**Hypothesis 5 (H5).** *Younger people are more prone to believe in conspiracy theories about vaccines and vaccination.*

Education is consistently reported as an important socio-demographic predictor in the case of conspiracy beliefs [80,81] and of vaccine and vaccination-related conspiracy beliefs in particular [82,83]. In general, the more educated individuals are, the less they tend to embrace conspiracy theories. As van Prooijen (2017) [81] accurately explains, high education leads to cognitive sophistication, to the feeling of control over a (distressing) situation, and to a privileged socio-economic status, which in turn decreases the probability to embrace conspiracy beliefs. Education is also strongly associated with critical thinking, already discussed here, and with skepticism [40,84], which negatively correlate with conspiracy beliefs. Nevertheless, it is worth mentioning that, given the complexity of the current media landscape, and particularly of health topics, educational background might not be able to protect individuals against conspiracy messages [82]. In what specifically concerns the current pandemic, different studies [7,27] have found a negative correlation between education and COVID-19-conspiracy beliefs, including vaccine and vaccination-related conspiracy beliefs. Furthermore, Arshad et al. (2021) [85] also demonstrated that education is negatively associated with conspiracy theories regarding the COVID-19 vaccine and vaccination. Following this line of reasoning, here, we advance hypothesize that:

**Hypothesis 6 (H6).** *More educated people are less prone to believe in conspiracy theories about vaccines and vaccination.*

Religion type and religiosity are other factors that might be associated with conspiracy beliefs in general [86–88] and with vaccine-related conspiracy beliefs in particular [71,88]. As shown by Robertson and Dyrendal (2018) [89], higher religiosity can positively correlate with greater conspiracy beliefs, given that religion and conspiracy theories have aspects in common such as esotericism, millennialism, and prophecy. Hart and Graether (2018) [90] also demonstrated that individuals who believe in conspiracy theories have the tendency to be more religious. The association between religiosity, understood as “the depth of faith in religion” [86] (p. 6), and conspiracy beliefs is partly mediated by anti-intellectualism [87]. In fact, individuals who embrace a religious worldview tend to consider that “faith is superior to reason and that scientific inquiry will lead to the invalidation of religious

beliefs" [87] (p. 1050). In the case of vaccines and vaccination, this perspective might have serious consequences, invalidating epidemiologists' and authorities' efforts to eradicate severe diseases. In what specifically concerns the current pandemic, different studies have shown that religiosity correlates with COVID-19 conspiracy beliefs [86] or with vaccination hesitancy [91,92]. Based on this, we suggest that:

**Hypothesis 7 (H7).** *People who exhibit higher levels of religiosity are more prone to believe in conspiracy theories about vaccines and vaccination.*

### 3. Materials and Methods

In order to analyze the variables predicting belief in conspiracy theories about COVID-19 vaccines, we conducted a national survey using an online panel ( $N = 945$ ), representative of the population of Romania that has access to the internet and is aged 18 or higher, using quotas for gender, age, and geographical region. The main characteristics of the sample were the following: the mean age was 43.11 years ( $SD = 13.08$ ); the sample consisted of 50.6% women and 49.4% men; the sample consisted of 47.3% people with low education (people who completed any of the ISCED 0 to ISCED 3 education levels), 13% people with medium education (people who completed the ISCED 4 education level), and 39.7% people with high education (people who completed any of the ISCED 5 to ISCED 8 education levels); people living in urban areas accounted for 81.9% of the sample. The national survey was conducted by Daedalus New Media Research (part of Kantar Romania) and the data were collected during 1–9 April 2021.

### 4. Measures

To measure *belief in conspiracy theories about vaccines/vaccination*, we used a 7-point Likert scale with seven items, ranging from 1 (believe to be completely false) to 7 (believe to be completely true). Given the high proliferation of conspiracy theories about vaccines and vaccination within the current media environment [93], we asked respondents to judge seven statements related to prominent narratives that were spread in the media during the COVID-19 pandemic claiming that the vaccination of children is dangerous and is kept secret, that the link between vaccines and autism is kept secret, that people are being fooled about the effectiveness and the safety of vaccines, that data on vaccine safety and effectiveness are often fabricated, and that pharmaceutical companies hide the dangers of vaccines. The items were loaded on one factor, with loadings ranging from 0.818 to 0.892 ( $\alpha = 0.939$ ,  $M = 3.68$ ,  $SD = 1.76$ ).

*Age* was measured in years old ( $M = 43.11$ ,  $SD = 13.08$ ).

To measure *education*, we used an 8-point ordinal scale from 1 (*no education at all*) to 8 (*graduate studies*) ( $M = 5.92$ ,  $SD = 1.28$ ).

To measure *religiosity* (the frequency of going to church component), we asked participants about the frequency of going to church on a 7-point Likert scale ranging from 1 (*daily*) to 7 (*never or almost never*) ( $M = 4.91$ ,  $SD = 1.30$ ). We used this particular type of measurement in order to better cover the behavioral component of religiosity rather than self-perceived religiosity because the frequency of going to the church might, in some cases, show a stronger commitment to religious beliefs.

To measure *critical thinking disposition* (the reflective skepticism component), we used a 7-point Likert scale with four items, ranging from 1 (*very unlikely*) to 7 (*very likely*). The scale was adapted from Sosu (2013) [94]; we asked respondents to assess whether the following statements were applicable to them: "I often re-evaluate my experiences so that I can learn from them", "I usually check the credibility of the source of information before making judgements", "I usually think about the wider implications of a decision before taking action", and "I often think about my actions to see whether I could improve them". The items were loaded on one factor, with loadings ranging from 0.830 to 0.892 ( $\alpha = 0.882$ ,  $M = 5.61$ ,  $SD = 1.22$ ).

To measure *perceived usefulness of SNS* (mainly for information-related purposes), we used a 7-point Likert scale with three items, ranging from 1 (*to a very little extent*) to 7 (*to a very great extent*). The scale was adapted from Lee and Choi (2018) [95]; we asked respondents to judge the extent to which the following statements they considered correct for them: “I usually take information through SNS”, “I utilize information gained from SNS”, “I immediately update information received from SNS”. The items were loaded on one factor, with loadings ranging from 0.903 to 0.922 ( $\alpha = 0.895$ ,  $M = 3.83$ ,  $SD = 1.71$ ).

To measure *perceived incidence of fake news about COVID-19 vaccines/vaccination*, we asked respondents to estimate the percentage of COVID-19-vaccine-related news (out of the total percent of news) they believe to be counterfeit or even false ( $M = 50.21$ ,  $SD = 26.01$ ).

To measure *frequency of COVID-19 news consumption from websites, SNS, and IM apps*, we used three items, rated on a scale ranging from 0 (*no consumption at all*) to 7 (*every day consumption*); the scale was used in other studies [96] and it approximated the number of days in the previous week that people consumed COVID-19-related news from websites (other than official websites and social networking sites), SNS (such as Facebook, Instagram, Twitter, etc.), and IM apps (such as WhatsApp, Facebook messenger, etc.). The items were loaded on one factor, with loadings ranging from 0.835 to 0.880 ( $\alpha = 0.819$ ,  $M = 2.49$ ,  $SD = 2.21$ ).

## 5. Results

In order to construct a profile of the believer in conspiracy theories about vaccines/vaccination, we ran a hierarchical OLS regression model (see Table 1).

**Table 1.** OLS regression model predicting belief in conspiracy theories about COVID-19 vaccines.

	B	SE	B
Block 1			
(Constant)	3.344	0.507	
Age <sup>a</sup>	0.005	0.004	<b>0.034</b>
Education <sup>b</sup>	−0.230	0.045	<b>−0.167 ***</b>
Frequency of going to the church (religiosity) <sup>c</sup>	−0.109	0.042	<b>0.081 **</b>
<b>Adj R<sup>2</sup></b>	<b>0.036</b>		
Block 2			
Critical thinking disposition <sup>d</sup>	0.077	0.045	<b>0.053</b>
Perceived usefulness of SNS <sup>e</sup>	0.137	0.034	<b>0.132 ***</b>
Perceived incidence of fake news about COVID-19 vaccines/ vaccination <sup>f</sup>	0.022	0.002	<b>0.326 ***</b>
Frequency of COVID-19 news consumption from websites, SNS, and IM apps <sup>g</sup>	−0.012	0.026	<b>−0.015</b>
<b>Adj R<sup>2</sup></b>	<b>0.157</b>		

The reported  $\beta$  weights are final  $\beta$  weights. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . <sup>a</sup> Continuous variable (in years). <sup>b</sup> Coded from 1 = low to 8 = high. <sup>c</sup> Coded from 1 = low to 7 = high. <sup>d</sup> Coded from 1 = low to 7 = high. <sup>e</sup> Coded from 1 = low to 7 = high. <sup>f</sup> Continuous thermometer variable (from 0% to 100%). <sup>g</sup> Coded from 1 = low to 7 = high.

On a general level, we found that people’s perceptions about the incidence of fake news on COVID-19 topics, the usefulness of SNS, along with education and religiosity are significant predictors of belief in conspiracy theories, while the frequency of COVID-19 news consumption from websites, SNS, and IM apps, critical thinking disposition, and age do not play a significant role in the profile of the believer in such narratives.

Specifically, the results show that critical thinking disposition is not a significant predictor of belief in conspiracy theories about vaccines and vaccination; thus, H1 cannot be supported. The results show there is not a significant correlation between people’s disposition towards critical thinking and their tendency to believe in COVID-19-related conspiracy theories.

On the other hand, those people who more strongly believe that SNS are useful for being updated with any type of information are more prone to believe in conspiracy theories about vaccines and vaccination, supporting H2. In line with other research studies [31],

these results show that people using social media platforms to obtain information related to COVID-19 topics are more likely to believe in conspiracy theories about the disease.

Furthermore, people who perceive a higher incidence of fake news related to COVID-19 vaccination are more prone to believe in conspiracy theories about vaccines and vaccination, supporting our third hypothesis.

In terms of the COVID-19-related frequency of news consumption from online sources (i.e., general websites other than the official ones, social networking sites, and instant messaging apps), the results are not significant, thus invalidating our fourth hypothesis. This is relatively surprising since we expected a higher frequency of news consumption from such online sources to be associated with a higher tendency to believe in conspiracy theories about vaccines/vaccination.

As far as age is concerned, the results from our study are not significant (H5 was invalidated); age is not a significant predictor of belief in conspiracy theories, even though there are studies confirming that younger people are more prone to believe conspiracy narratives [11].

In terms of education, the results confirm that less-educated people are more prone to believe in conspiracy theories about vaccines and vaccination, thus offering support for H6. This result confirms prior studies [81] suggesting that people with high levels of education are less likely to believe in conspiracy theories than people with low levels of education, with this relationship being “the result of the complex interplay of multiple psychological factors that are associated with education” [81] (p. 50).

Furthermore, the results show that people who frequently go to church (i.e., people with higher levels of religiosity) are more prone to believe in conspiracy theories about vaccines and vaccination, supporting our H7.

## 6. Discussion and Conclusions

Fighting and overcoming the current pandemic has become one of the most difficult issues of public concern, especially in countries such as Romania, where vaccination and mass immunization rates are discouragingly low at the moment, despite the fourth pandemic wave we have just entered [97]. The widespread acceptance of a vaccine against COVID-19 is essential both for self-protection and the protection of others, but appears to be hindered by various factors, among which conspiratorial claims and narratives play a key role [7,98]. These narratives have become increasingly popular since COVID-19-related (online) news consumption has increased dramatically, as a natural consequence of people’s interest in this completely new and unexpected respiratory disease caused by SARS-CoV-2. Against this background, our study aimed to empirically underpin possible predictors of individuals’ tendencies to embrace (and eventually) circulate conspiracy narratives in order to provide a clearer image of who is more prone to believe in such misleading content about the COVID-19 pandemic in Romania.

On a general note, our results show that people’s perceived usefulness of social media and perceived incidence of fake information about the virus in the media along with education and religiosity are strong predictors of Romanians’ inclination to believe and further proliferate conspiracy theories related to vaccines and vaccination. At the same time, a higher frequency of news consumption from online sources (i.e., from general websites, other than official ones, from social networking sites, and instant messaging apps), critical thinking disposition, and age are not significant predictors of belief in conspiracy theories. Further, we explore possible explanations for each of these empirical findings and offer useful recommendations aimed at stimulating better public responses to the ongoing crisis in Romania.

The results from this study do not show a significant correlation between people’s disposition towards critical/analytic thinking and their tendency to believe in conspiracies related to the COVID-19 context. Therefore, our first hypothesis was not validated. Nevertheless, we believe that analytic thinking is an important means to counter the widespread acceptance of conspiracy theories [6,37,42], as education proved to play an important role.

In other words, we suggest that in order to successfully navigate conspiracies, misleading news, and other information disorders, one needs a complete set of skills and knowledge to critically evaluate digital content of varied types. By developing and practicing deliberation and contemplation, by stopping/pausing to critically evaluate new information before amplifying, appreciating, or sharing it, and by engaging in fact-checking, etc., people's vulnerability to misinformation could be significantly reduced.

Nevertheless, main findings show that higher use of SNS for people to keep abreast of what is happening in the world (H2) and a higher perceived incidence of fake news related to COVID-19 (H3) are strongly associated with a higher tendency to believe in conspiracy theories about vaccines/vaccination. In line with previous research [31,34], our results support the idea that people who use social media platforms to learn about the coronavirus-related topics are more likely to give credit to conspiratorial content about the disease and its wider implications. However, this is not so surprising in at least two respects: (1) information circulating on social media has been shown to have a greater potential to be misleading or even false [99]; (2) when mainstream media coverage related to COVID-19 has been lacking or provided rather conflicting aspects of what people could do to limit their exposure to the infection or to help [100], social media has covered these issues either through false or true data, and social platforms have seen high growth in engagement [101].

Furthermore, as the results validating our third hypothesis show, people who perceive a higher incidence of fake news about COVID-19 vaccination are more likely to trust conspiracy theories about vaccines and vaccination. We believe this may be due to the fact that people who believe that, with regard to the pandemic, they are also exposed to a lot of disinformation may experience high levels of stress and anxiety, thus drawing on available heuristics to navigate the "infodemic" associated with the COVID-19 pandemic. In this context, we suggest taking more effective measures to reduce informational "pollution" in the digital media environment, either by imposing stricter regulations on platforms or, even more effectively, by making people aware of the dangers they may come across in the digital media arena and by supporting them to act more responsibly when engaging with any form of online content. First, people should be aware of the potential dangers in the current media environment; then, they should be encouraged to actively check information on a regular basis—i.e., to practice lateral reading [102]. Yet, in order to achieve all the above, "public institutions need to work together and with digital platforms, media professionals, fact checkers and researchers" [103].

At the same time, in contrast to what we initially hypothesized, our results do not support the claim that people who consume more COVID-19-related news from online sources such as general websites, social networking sites and instant messaging apps are more prone to believe in conspiracy theories about vaccines and vaccination (thus offering no support for H4). Although we find this result rather counterintuitive (especially since previous studies have found a positive correlation between exposure to digital media and conspiracy beliefs—see, for instance, Ali et al., 2020 [65]; De Coninck et al., 2021 [68]; Fridman et al., 2020 [67]), one possible explanation could be that people do not always make clear distinctions between the different sources of information they use to gain knowledge about COVID-19 topics, particularly since these topics have been well covered by all media. Additionally, building on findings provided by other recent research conducted in Romania [101] which show higher levels of intermedia agenda settings during the pandemic, we argue that this could explain, at least in part, the blurring of boundaries between the role played by online and offline media in COVID times.

In terms of socio-demographic data, we tested age and education as significant predictors for people's tendencies to believe in conspiracies. With respect to age, our results did not support the claim that younger people are more likely to believe conspiracy theories about vaccines and vaccination (thus invalidating H5). In contrast to similar research that provided empirical evidence for the tendency of younger people to hold conspiracy beliefs related to COVID-19 [7,27], in our study, age does not appear to play an important role in

this regard. While it would be instructive to further investigate the complex interactions between demographic factors such as age and belief in conspiracy narratives, we argue, based on our findings, that people of all ages are vulnerable to conspiracy theories; therefore, solutions against misinformation should be designed and applied to people of all ages. Media and information literacy courses might be helpful in making people more aware of conspiracy theories and of other forms of misleading/false information circulating online.

Unlike age, education seems to affect Romanians' conspiratorial beliefs about COVID-19. Specifically, as our results show, people with a low level of education are more prone to believe in such theories (H6 validated). Consistent with previous research [27,85], our study provides empirical support for the idea that the more educated citizens are, the less likely they are to embrace conspiracy narratives. This demonstrates the need to design solutions that should include education as a key factor in guiding effective responses to crisis situations of all kinds (and especially health-related ones) [103]. However, it does not mean that people's educational background alone may be able to prevent individuals from trusting conspiracy messages, particularly in today's media landscape, which is far too complex and far too abundant in health-related topics. Our point is that education, seen as a complex of factors, can help equip citizens with the tools to debunk false stories and conspiracies. As many scholars have suggested, education is linked to cognitive sophistication, skepticism, critical thinking abilities, or the sense of control over one's social environment [40,81,84], which all have the potential to raise people's attention to the dangers associated with misleading or conspiratorial information surrounding the pandemic and increase their resistance to the latter.

Finally, one last relevant result of this study (validating H7) shows that a higher frequency of church attendance is associated with a higher tendency to believe in conspiracy theories about vaccines and vaccination. This is in line with previous studies that highlight that higher levels of religiosity correlate positively with people's propensity to give credence to false claims about the virus and its treatment [71,91]. We argue that this result is of major importance given that people are usually very sensitive when it comes to their religious attitudes and behaviors. Additionally, given people's highly interactive behavior, they tend to form small, often close-knit communities around the church, which could facilitate the emergence of "offline echo chambers" (i.e., spaces where people are not often exposed to alternative opinions/ voices). These communities can prove fertile ground for the dissemination and amplification of conspiracy narratives, and recent research [104] has provided evidence regarding certain conspiracy theories circulating among church members. Furthermore, in Romania, there are many priests and clerical figures who explicitly and openly promoted vaccine skepticism and conspiracy theories [105,106]. Against this background, we argue that people should be encouraged and taught to think for themselves, get information from trusted sources, and avoid taking all the news stories circulating in their small groups for granted (whether family groups, groups of friends, religious groups, etc.). In this respect, the need to increase digital media and information literacy among citizens (mainly among the so-called "digital-natives") is extremely evident and strongly advocated for by specialized institutions and experts (e.g., the European Commission's High-Level Expert Group on Fake News and Online Disinformation). Based on our findings, we also support and argue for the need to develop strategies to deeper integrate media literacy into the existing curricula. In fact, there is a strong preoccupation across Europe for increasing media literacy among citizens (especially youths) and for developing strategies to fight false information online. Finland, for instance, topped the ranking of Europe's most media- and digital-literate country [107]. The Finnish government took the fight against online disinformation seriously and launched a scaling up project to increase media literacy and reform the national educational system to emphasize critical thinking in K-12 institutions (from kindergarten to high school). The same report [107] shows that, unlike Finland, Romania is among the countries least equipped to resist the post-truth, fake news, and their offshoots. Hence, we believe that teaching media literacy

and educating (a younger) audience to critically evaluate digital content of various kinds is a timely and extremely important effort in the increasingly complex information ecosystem.

Beyond the variables mentioned above and the interaction between them, which outline a rather personalized profile of Romanians' propensity to believe and propagate conspiracy narratives, we argue that there are other factors that could further explain and refine the results of our study. They could be related to what we call the peculiarities of the Romanian citizens and include various aspects such as those we expose below. The population's generalized distrust in authorities—i.e., in government, public institutions, and political leaders—has a long history in Romania and seems to be deepening quite a lot (for a detailed argumentation see, for instance, Radu and Dobrescu, 2019 [108]). The lack of trust in societal institutions leads, in our opinion, to more and more people disregarding both established government rules (e.g., public health directives) and established social norms (e.g., adopting socially respectful behavior, i.e., wearing a mask, keeping a safe physical distance, taking a COVID-19 vaccine, etc.). In addition to higher levels of distrust in political bodies and other public structures, Romanians appear to experience a lack of interpersonal trust among themselves, which we suggest may also provide support for the findings presented by the current research. A lack of trust in other people is also widespread, and, we believe, deeply rooted in the communist past of the country, a time when no one could trust anyone. Finally, another circumstance that may support and nuance the results of our research refers to the emergence of extreme political ideas and parties that promote a discourse with nationalistic and xenophobic overtones (see the case of the recently founded AUR Political Party, whose leaders' voices have been strongly represented in the public space, militating against mask wearing and all the other types of restrictions and protective measures aimed at keeping the population safe). Corroborated with citizens' negative perception of domestic political performance in general and the inability of political institutions to provide timely solutions to citizens' demands (especially during the current crisis), this discourse that attempts to speculate on a sense of insecurity and discontent that exists in one part of society could pave the way for a whole series of conspiracy theories related to COVID-19.

The World Health Organization and health authorities around the globe are now working closely with social media platforms to provide citizens with evidence-based information about the current pandemic and to help them understand more about the problematic times they are living in. However, the widespread distribution of factually correct COVID-19-related information is countered by a corresponding amount of conspiratorial and misleading narratives targeting the same hot topic on everyone's agenda and infusing people's minds with lots of rumors, doubts, and conflicting ideas. Certainly, not all the people are equally affected by the current health misinformation and its seemingly uncontrollable virus-like spread in the new digital ecosystem. Still, as our findings show, there are many people that remain vulnerable when confronted with false and conspiracy-driven narratives about vaccines and vaccination, and their profile appears to be shaped by various factors such as the perceived usefulness of social media, the perceived incidence of fake information about the virus in the media, education, and religiosity.

As any other social sciences study, this study comes with limitations too. One important limitation is linked to the subjective way some predictor variables (e.g., critical thinking disposition and perceived incidence of fake news) used in this study were measured. Nevertheless, taking into account the main scope of this study, which is to analyze and inform the reader about the profile of the believer in conspiracy theories in the context of the COVID-19 pandemic, we believe that self-assessment variables might prove to be useful tools in unveiling people's perceptions regarding different issues in the current media environment.

Learning more about the profile of the believer in conspiracy theories is just one of the important steps that need to be taken to combat COVID-19-related disinformation and limit its complex and deeply negative impact on individuals and society. In this context, we hope that our study can help to advance evidence-based recommendations for key stakeholders

(e.g., policymakers, journalists, health professionals, researchers, teachers, etc.) who are in a position to develop or implement measures to address the dangers posed by potentially harmful information circulating as misleading narratives about COVID-19-related topics, discouraging people from complying with restrictive and protective measures.

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