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Divergent perspectives among medical and non-medical personnel implications in the context of the Covid-19 pandemic

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Abstract: In Romania, an increased number of infections with the new coronavirus have been reported, which has led to the deterioration of the state medical system, already facing multiple problems due to outdated infrastructure, lack of equipment and lack of personnel. Lack of trust in the Romanian healthcare system and the absence of basic health education programs are considered among the main causes that contributed to the skepticism with which Romanian citizens viewed the pandemic situation, complicating the management of the COVID-19 pan-demic. Objectives: The aim of study was determining the differences in perspectives on COVID-19 between individuals with and without medical training and assessing their potential impact on pandemic management. A cross-sectional study was conducted using a questionnaire, that was administered to a sample of 253 individuals from June 2022 until March 2023 and was distributed online through the Google Forms platform. The data obtained from participants' questionnaire responses were entered into the Microsoft Office Excel platform and then statistically processed using the Statistical Package for Social Sciences (SPSS) software. Frequency tables were employed, and for qualitative data, chi-square tests were applied. The statisti-cal significance was established by referencing a "p" value of 0.05, with values below this threshold considered statistically significant. In regards to respondents' perception about the existence of the virus or the origin of the pandemic, 25.7% of them believed that the virus was artificially created and accidentally released, while 15% believed that it was released by malevolent entities. The burden of restrictions was felt most among those without medical training at a rate of 17.3%. Of those studying/working in the medical field, 57.1% con-sidered that mandatory vaccination was the only solution to overcome the pandemic. Of those without medical education, 56.7% considered compulsory vaccination as a form of abuse. Those who study/work in the field believe that it is absolutely necessary to implement health education programs in schools. Indi-viduals in rural areas were more inclined to deny the existence of the SARS-CoV-2 virus. Moreover, denial rates were elevated among those with lower educational attainment. This cohort demonstrated a predisposition towards a "counter-system" mindset. Skepticism regarding Covid vaccines and the healthcare system was more pronounced within this demographic. Respondents with medical education exhibit heightened trust in measures enforced by authorities, official statistics, and vaccination campaigns.

Keywords: Covid 19, SARS-CoV-2; healthcare; questionnaire

1. Introduction

SARS-CoV-2, the novel coronavirus, is among the highly pathogenic coronaviruses with the ability to infect humans. Cases of infection with this virus were initially detected in December 2019 in Wuhan, China. It was identified as a new type of coronavirus, distinct from the previously known ones, and quickly spread within China before extending to other parts of the world [1].

As of January 30th, the World Health Organization (WHO) classified the new coronavirus epidemic as a public health emergency with international implications. In February 2020, the WHO officially named the new disease "*COVID-19*" while the virus was designated as "*SARS-CoV-2*" by an international virus classification committee [1,2].

Throughout February 2020, morbidity and mortality were high in China, while the incidence in other Asian countries, Europe, and North America remained relatively low. It is believed that *SARS-CoV-2* successfully transitioned from animals to humans at the Huanan seafood market in Wuhan, China. However, the identification process of potential intermediate hosts appears to have been overlooked in Wuhan, limiting our complete understanding of the new virus [3].

In December 2019, cases of pneumonia with unknown etiology were reported in Wuhan, China. Subsequently, a new coronavirus was identified and later classified as *SARS-CoV-2*. Initially, it rapidly spread within China and then extended beyond the country's borders. Although bats are considered the source of the virus, the exact intermediate host facilitating transmission to humans is not precisely known. With the onset of the first cases, it was observed that the virus is transmissible from person to person through Flugge droplets released during sneezing and coughing. Additionally, asymptomatic individuals can also serve as a source of infection. The virus can persist on various surfaces, and touching them, followed by touching the nose, eyes, and mouth, can lead to infection [1,3].

SARS-CoV-2 infection can result in a variable severity of symptoms, ranging from asymptomatic cases to severe forms of the disease. Mild symptoms such as cough, fever, myalgia, fatigue, and sore throat may be present, but in severe cases, the infection can cause respiratory distress (including acute respiratory distress syndrome), shock, and multiorgan failure [4-7].

Following a better understanding of the virus transmission, several measures have been implemented to prevent its spread among the population. These include wearing protective masks in crowded spaces, practicing social distancing, home isolation for infected individuals and their contacts, and, last but not least, the introduction of vaccines against *SARS-CoV-2* [8,9].

In Romania, a very high number of infections with the new coronavirus has been reported, leading to the strain on the state medical system, which was already facing multiple issues due to outdated infrastructure, lack of equipment, and personnel shortages [10-12].

The vaccination campaign has not yielded the desired effect, with a vaccination rate among the population of 42.1%, well below the European average of 62.1%. Lack of trust in the Romanian healthcare system and the absence of basic health education programs are considered among the main causes that contributed to the skepticism with which Romanian citizens viewed the pandemic situation, complicating the management of the COVID-19 pandemic [11,13, 14].

This study was conducted with the aim of determining the differences in perspectives on COVID-19 between individuals with and without medical training and assessing their potential impact on pandemic management.

2. Materials and Methods

To determine how Romanian citizens perceive the pandemic context, a cross-sectional study was conducted using a questionnaire consisting of 28 questions, distributed to individuals both within and outside the medical field. The questionnaire included the first 6 questions collecting demographic data (age, gender, place of origin, religion, ethnicity, and the latest completed educational level), while the remaining 22 gathered information about the participants' field of activity (medical/non-medical) and their views on the COVID-19 pandemic and the state medical system. The questionnaires were administered to a sample of 253 individuals from June 2022 until March 2023. The questionnaire was distributed online through the Google Forms platform. The questionnaire's online header mentioned the study's purpose, ensured the anonymity and confidentiality of responses, and completing the questionnaire signified the participants' agreement to participate in the study. Questionnaires that were not completed in full were excluded from the study. The questions were mostly closed with ordered answers or closed with unordered answers, but binary questions were also included with a maximum time of 15 min to complete. There were instructions for each question on the type of answers: single or multiple. The data obtained from participants' questionnaire responses were entered into the Microsoft Office Excel platform and then statistically processed using the Statistical Package for Social Sciences (SPSS) software. Frequency tables were employed, and for qualitative data, chi-square tests were applied. The statistical significance was established by referencing a *"p"* value of 0.05, with values below this threshold considered statistically significant.

3. Results

From the total number of respondents, the most, at a percentage of 33.6%, belonged to the age category of 45-64 years, followed by the age range of 18-24 years with a percentage of 28.5%. The smallest percentage, only 2.8%, was represented by those in the age category over 65-74 years. The questionnaire was predominantly completed by females, with a percentage of 54.9%. Regarding the place of origin, 81.8% of subjects declared that they are from urban areas. Regarding the last completed education level, the majority of respondents, at a percentage of 64%, have higher education, 28.1% graduated from high school, and 5.1% completed post-secondary education. Only 2% of respondents completed only primary school, and the percentage of those without any education is 0.8%. Among the respondents, 50.2%, were been with no medical training and not working in the field. A percentage of 41.5% work in the medical field, while 8.3% claim to have medical training but do not work in the healthcare system.

In response to question: *"Did you believe in the existence of the SARS-CoV-2 virus?"* 91.3% of participants answered affirmatively. For another question: "*What was your perception regarding the origin of the pandemic?"* 30.8% of respondents had no opinion, and 28.5% considered it to be just an unfortunate coincidence. Additionally, 25.7% believed the virus was artificially created and accidentally released, while 15% thought it was released by malevolent entities. 51% of participants claimed to have been infected with the new virus, 30.4% denied infection, and the remaining 18.6%, were unsure. Furthermore, 84.2% of respondents had a family member infected with SARS-CoV-2. In contrast, 67.2% claimed to have had no deaths among family or close friends from Covid-19. In response to question: *"Were you afraid to come into contact with people infected with the pandemic virus?"* the most of participants, at a proportion of 56.1%, answered that they did not fear this aspect.

For question: *"What was your opinion about the measures implemented by authorities to combat the virus?"* 43.9% of respondents answered, *"I agreed with them and considered*

them absolutely necessary" 42.7% with *"I agreed with the idea of taking measures, but I considered the current ones to be ineffective/poorly implemented"* and the remaining 13.4% answered, *"I did not agree with the measures and considered them to be restrictive of individual freedom"*, 87.7% of participants considered testing for Covid-19 important.

For question: *"How have anti-Covid measures affected your daily life?"* 64.4% said they felt the limitations imposed by these measures but were not particularly bothered, 24.5% responded that they carried out their daily activities as before that, and the remaining 11.1% could not carried out their daily activities, feeling very limited by restrictions. Among the respondents, only 34.4% had complete trust in the statistics released by authorities, with the majority of 50.2% considering the data were imprecise. It is also noteworthy that 15.4% claimed that the number of deaths was artificially increased to manipulate the population. Only 13.4% of participants chose not to vaccinate, 69.6% opted for vaccination on their own initiative, and 17% vaccinated because they felt constrained by the measures implemented by authorities. It is worth mentioning that 60.1% of respondents have confidence in vaccines in general, 28.5% were pro-vaccination but have uncertainties about vaccines for *SARS-CoV-2*, and only 11.5% were entirely anti-vaccine. 46.2% of participants considered the implementation of mandatory vaccination was a form of abuse, while 36% of them agreed with the implementation of such a measure.

For question: *"Did you constantly inform yourself about the latest news related to the virus/pandemic?"* 53.3% answered "*Yes, occasionally*," 34% with "*Yes, frequently*," and 10.7% with "*No, I was not interested in the subject*." Among the methods of obtaining information, the most popular, with a percentage of 47%, were represented by medical publications and expert advice in the field, 9.5% obtained information from television, 9.1% through social media platforms, and only 2% obtained information from discussions with friends and other daily contexts.

Responses to question: *"Did you consider hospital treatment for Covid effective?"* reveal that 46.6% of participants were uncertain about this aspect, while 43.1% viewed the therapy as effective, in contrast to the 10.3% who stated otherwise. The majority of respondents (84.6%) disagreed with the use of medication not recommended by authorities, 88.9% of participants believed there is a lack of basic medical knowledge among the population. The majority (83%) have asserted that implementing health education modules in the school curriculum is absolutely necessary, while only 4% considered it useless.

In response to question: *"What did you consider the most optimal solution for overcoming the pandemic?"* 48.6% responded with *"Voluntary vaccination of as much of the population as possible"* 29.2% with "*Lifting restrictions and having a large portion of the population contract the disease for natural immunity"* 15% with *"Introducing mandatory vaccination"* 4.3% with *"Applying more severe restrictions regardless of vaccination status"* and 2.8% with *"Applying more severe restrictions for the unvaccinated."*

Regarding the relationship between respondents' background and the question *"Did you believe in the existence of the Covid 19 virus?"* significant differences were identified (p=0.021), with the majority in urban areas (93.2%) believing in the virus. (Table 1)

Table 1. Relationship between the questions *"Did you believe in the existence of the Covid-19 virus?"* and *background, last school, have or not training in the medical field?*

		Did you believe in the existence of the Covid-19 virus?			p value
		Yes	No	Total	
What is the background?	Rural	38 (82.6)	8 (17.6)	46 (100)	*0.021*
	Urban	193 (93.2)	14 (6.8)	207 (100)	
What is the last school completed?	Elementary School	1 (14.3)	6 (85.7)	7 (100)	*0.0001*
	Post-High School	8 (61.5)	5 (38.5)	13 (100)	
	High School	66 (93.0)	5 (7)	71 (100)	
	Higher Education	156 (96.3)	6 (3.7)	162 (100)	
Do you work or have training in the medical field?	Yes, working/studying in the field	104 (99.0)	1 (1.0)	105 (100.0)	*0.0001*
	Yes, but not working in the field	21 (100.0)	0 (0.0)	21 (100.0)	
	No	106 (83.5)	21 (16.5)	127 (100.0)	

Concerning the relationship between the questions *"Did you believe in the existence of the Covid 19 virus?"* and *"What is your highest level of education completed?"* using the chi-square test, a statistically significant result was obtained (p=0.0001). Relationship between the questions *"Did you believe in the existence of the Covid 19 virus?"* and "*Do you work or have training in the medical field?"*, we can observe that all respondents with medical training believed in the new virus. The lowest percentage (83.5%) is among those who do not work in the medical field (p-0.0001). The relationship between the questions *"What was your perception of the origin of the pandemic?"* and *"Do you work or have training in the medical field?"* presented in Table 2, obtained a statistically significant result (p=0.001).

Table 2. Relationship between the questions *"Do you work or have training in the medical field?"* and *"What was your perception related to the origin of the pandemic?"*.

p value 0.0001		*Do you work or have training in the medical field?*			Total
		Yes, but not working in the field	Yes, working/studying in the field	No	
What was your perception related to the origin of the pandemic?	I considered it was a simple accident/unfortunate coincidence	4 (19.0)	45 (42.9)	23 (18.1)	72 (28.5)
	I considered the virus was artificially created and accidentally released	9 (42.9)	20 (19.0)	36 (28.3)	65 (25.7)
	I considered the virus was intentionally released by malicious entities	4 (19.0)	12 (11.4)	22 (17.3)	38 (15.0)
	I did't have an opinion on this matter	4 (19.0)	28 (26.7)	46 (36.2)	78 (30.8)

In Table 3 the relationship between the questions "*What was your opinion on the measures implemented by authorities to combat the virus?"* and *"What is your age?"* is observed. 71.4% of respondents aged 65-74 agreed with the measures and considered them absolutely necessary, while 60% of those aged 25-34 agreed with the measures but found them poorly implemented. The highest percentage of those who disagreed with the measures and considered them a violation of individual freedom (20.8%) is found among those aged 35-44 (p=0.016).

Table 3. Relationship between the questions *"What was your opinion on the measures implemented by authorities to combat the virus?"* vs Age, environment of origin and working or trained in the medical field.

		What was your opinion on the measures implemented by authorities to combat the virus?				P value
		I disagreed with the measures and considered them restrictive to individual freedom	I agreed with them and considered them absolutely necessary	I agreed with the idea of taking measures, but I considered the current ones to be ineffective/poorly implemented	Total	
What is your age?	18-24 years	6 (8.3)	23 (31.9)	42 (58.3)	72 (100.0)	
	25-34 years	3 (75)	13 (32.5)	24 (60)	40 (100.0)	
	35-44 years	10 (20.8)	25 (52.1)	13 (27.1)	48 (100.0)	
	45-64 years	13 (15.3)	45 (52.9)	27 (31.8)	85 (100.0)	
	65-74 years	1 (12.5)	5 (62.5)	2 (25.0)	8 (100.0)	
What is the environment of origin?	Rural	13 (28.3)	17 (37.0)	16 (34.8)	46 (100.0)	0.009
	Urban	20 (9.7)	94 (45.4)	92 (44.4)	207 (100.0)	
Are you working or have you trained in the medical field?	Yes, but I don't work in the field	1 (4.8)	8 (38.1)	12 (57.1)	21 (100.0)	0.001
	Yes, I work/study in the field	3 (2.9)	52 (49.5)	49 (46.7)	105 (100.0)	
	No	29 (22.8)	51 (40.2)	47 (37)	127 (100.0)	

45.4% of those from urban areas considered Covid-19 measures absolutely necessary, while 44.4% considered current measures poorly implemented. In contrast, 28.3% of those from rural areas disagreed with the measures imposed by authorities. This information is derived from the cross-referencing of the questions *"What was your opinion on the measures implemented by authorities to combat the virus?"* and *"What is your environment of origin?"* (p=0.009). When crossing the same question with the question *"Do you work or have training in the medical field?"* a statistically significant result was obtained (p=0.001), (Table 3)

In the relationship between the questions *"How have anti-Covid measures affected your daily life?"* and *"Do you work or have training in the medical field?"*, 76.2% of those with medical training but not working in the healthcare system have felt the limitations imposed by the pandemic context but have not declared themselves significantly affected. 27.6% of those working in the medical system claimed to have carried out their daily activities as before. The burden of restrictions was most felt among those without medical training at a percentage of 17.3%, (p=0.026). (Table 4)

Table 4. Relationship between the questions *Do you work or have training in the medical field*? and other questions about the measures applied during the pandemic

		" *Do you work or have training in the medical field?"*			Total	P value
		Yes, but I don't work in the field	Yes, I work/study in the field	No		
"How have anti-Covid measures affected your daily life"	I carried out my activities as before and I did not feel limited	5 (23.8)	29 (27.6)	28 (22.0)	62 (24.5)	0.026
	I felt very limited and could not carried out my daily activities	0 (0.0)	6 (5.7)	22 (17.3)	28 (11.1)	
	I felt the limitations imposed by the that context, but I was not particularly disturbed	16 (76.2)	70 (66.7)	77 (60.6)	163 (64.4)	
Have you opted for vaccination?	Yes, because I felt constrained by the measures of the authorities	3 (14.3)	11 (10.5)	29 (22.8)	43 (17.0)	0.0001
	Yes, on your own initiative	15 (71.4)	90 (85.7)	71 (55.9)	176 (69.6)	
	No, I chose not to get vaccinated	3 (14.3)	4 (3.8)	27 (21.3)	34 (13.4)	
What was your opinion on vaccines created for SARS-Cov 2?	I did not trust vaccines	2 (9.5)	2 (1.9)	25 (19.7)	29 (11.5)	0.0001
	I was pro vaccination	13 (61.9)	82 (78.1)	57 (44.9)	152 (60.1)	
	I was pro vaccination but I had reservations/unclarities about the vaccine	6 (28.6)	21 (20.0)	45 (35.4)	72 (28.5)	
Would you agreed with the implementation of mandatory vaccination?	Yes, I think it was the only solution to defeat the pandemic	7 (33.3)	60 (57.1)	24 (18.9)	91 (36.0)	0.0001
	I was indifferent	3 (14.3)	11 (10.5)	31 (24.4)	45 (17.8)	
	No, I considered it a form of abuse	11 (52.4)	34 (32.4)	72 (56.7)	117 (46.2)	
Did you think that there was a lack of basic medical knowledge among the majority of the population in Romania?	Yes	21 (100.0)	105 (100.0)	99 (78.0)	225 (88.9)	0.0001
	No	0 (0.0)	0 (0.0)	28 (22.0)	28 (11.1)	
Do you consider it necessary the implementation Health Education modules in the school curriculum?	Yes, it is absolutely necessary	15 (71.4)	103 (98.1)	92 (72.4)	210 (83.0)	0.0001
	I don't consider it a priority	6 (28.6)	2 (1.9)	25 (19.7)	33 (13.0)	
	I consider it uselessness/loss of time	0 (0.0)	0 (0.0)	10 (7.9)	10 (4.0)	
What do you think would have been the most optimal solution for overcoming the pandemic?	More stringent restrictions regardless of individual vaccination status	0 (0.0)	6 (5.7)	5 (3.9)	11 (4.3)	0.0001
	More severe restrictions for non-vaccinated people	1 (4.8)	3 (2.9)	3 (2.4)	7 (2.8)	
	Removing restrictions and passing as much population as possible through the disease for the acquisition of natural immunity	9 (42.9)	17 (16.2)	48 (37.8)	74 (29.2)	
	Introduction of the obligation to vaccinate	2 (9.5)	29 (27.6)	7 (5.5)	38 (15.0)	
	Voluntary vaccination of the largest percentage of the population	9 (42.9)	50 (47.6)	64 (50.4)	123 (48.6)	
What is your opinion on the statistics released by the authorities on the number of infections and deaths?	I had trust them	6 (28.6)	50 (47.6)	31 (24.4)	87 (34.4)	0.0001
	I think the data was imprecise	13 (61.9)	49 (46.7)	65 (51.2)	127 (50.2)	
	I believe that the number of infections and deaths were been artificially increased to create panic among the population	2 (9.5)	6 (5.7)	31 (24.4)	39 (15.4)	

Thus, 85.7% of those who study/work in the medical field vaccinated themselves voluntarily. Among those who vaccinated to avoid restrictions imposed by authorities, the majority (22.8%) belong to the category without medical education. In the same category, we found the highest percentage of those unvaccinated (21.3%). In relationship between questions *"What were your opinion on vaccines developed for SARS-Cov 2?"* and *"Do you work or do you have medical training?"*, 78.1% of those who study/work in the medical field declared themselves pro-vaccine. The highest percentage of those with reservations about the Covid vaccine (35.4%) was observed among those without medical education. In the same category, the highest percentage of those who do not trust vaccines (19.7%) was also observed. Regarding the relationship between the questions *"Would you have agreed with the implementation of mandatory vaccination?"*, 57.1% of those who study/work in the medical field believed that mandatory vaccination was the only solution to overcome the pandemic. Among those without medical education, 56.7% considered mandatory vaccination as a form of abuse, while 24.4% declared themselves indifferent. It is worth mentioning that only 78% of those without medical education shared the same opinion. In terms of the same question, 98.1% of those who study/work in the field considered it absolutely necessary to implement health education programs in schools, 28.6% of those with medical education but not working in the field did not consider them a priority and the only ones who consider them useless are those without medical education, at a rate of 7.9%. Those studying/working in the field predominantly chose the answer *"voluntary vaccination of as many people as possible"* (50.4%). Those with education but not working in the health system predominantly opted for mandatory vaccination (27.6%), and among those with no medical education, the most popular option (42.9%) was to remove all restrictions. Regarding the relationship between the same question and the question *"What is your opinion on the statistics released by the authorities on the number of infections and deaths?"*, 47.6% of those working in the field trust the data released by authorities, 61.9% of those with medical training but not working in the healthcare system believed the data is imprecise and 24.4% of those without medical training claim that the number of deaths was artificially increased to create panic among the population.

The relationship between the questions *"Have you opted for vaccination?"* and *"What is your highest level of education completed?"* indicating that 78.4% of those with higher education voluntarily opted for vaccination, 46.2% of post-high school graduates have vaccinated themselves due to the constraints felt due to the measures imposed by authorities. Among those who chose not to vaccinate, the highest percentage (100%) is found among primary school graduates, followed by those without formal education (50%) and post-high school graduates (46.2%). By crossing the same question with the question "*Did you consider it necessary to implement Health Education modules in the school curriculum?"* we obtained a statistically significant p-value=0.0001. Those with higher education declared themselves supporters of these types of programs at a rate of 93.8%. In contrast, 53.8% of those with post-high school education did not consider these initiatives a priority and 23.1% of them considered them useless. The relationship for the questions *"What did you think was the most optimal solution to overcome the pandemic?"* the highest percentages for the answer *"remove restrictions and let a large percentage of the population go through the disease to acquire natural immunity"* were found among post-high school graduates (100%) and those who graduated from primary school (80%). 7% of high school graduates opted for *"applying stricter restrictions regardless of vaccination status"*. Among those with higher education, the most popular answers were *"voluntary vaccination of as many people as possible"* (53.7%) and *"introduction of mandatory vaccination"* (16.7%). Cross-referencing the questions

"What is your opinion on the statistics released by authorities regarding the number of infections and deaths?", 43.2% of those with higher education trust the statistics released by authorities. 59.2% of high school graduates believe the data is imprecise and the highest percentage of distrust (80%) was recorded among primary school graduates.

4. Discussion

No studies have confirmed the validity of an instrument designed to assess the various facets of mental health and well-being amid the COVID-19 pandemic. While there are validated instruments available for measuring pandemic-related fears, with suggestions for future research on diagnostic accuracy [15], additional tools have been validated for screening, diagnosis, and evaluating the effects on mental health, as well as forecasting mental health outcomes during the pandemic [16]. However, some of the validated tools have limitations in terms of age diversity, geographic coverage, exposure to COVID-19, and socio-economic status. Furthermore, certain tools do not encompass critical aspects of mental health, such as suicidal ideation or behavioral responses/coping strategies [17].

The first questions in the study looked at respondents' perception of the existence of SARS-CoV-2 virus, the origin of the pandemic or family damage following the onset of the disease. About the existence of the virus or the origin of the pandemic, 30.8% of respondents had no opinion, and 28.5% considered it just an unfortunate coincidence. Also, 25.7% believed that the virus was artificially created and accidentally released, while 15% believed that it was released by malevolent entities. Of the participants, 51% claimed to have been infected with the new virus, 30.4% denied the infection, and the remaining 18.6% were not sure. Of the respondents, 84.2% had a family member infected with SARS-CoV-2, and 67.2% claimed they had no deaths among family or close friends during the pandemic.

Different categories of population were compared to understand the origin of skepticism regarding the COVID pandemic. Xiong et al [18], conducted a multinational online snowball survey, with the aim of comparing knowledge and perceptions about COVID-19 between Chinese and US adults. Different perspectives on the origins of COVID-19 were identified between the two groups. Both the US and China had a relatively high intention to follow preventive recommendations in general. Both groups have expressed concern about the speed of COVID-19 vaccine development. In addition to this, among the Chinese respondents there is also the skepticism for the safety of the vaccines, and among the USA adults the concern for the effectiveness.

Socially marginalized individuals, like homeless and materially disadvantaged people, were considered vulnerable to infection with COVID-19. A cross-sectional study, also based on a survey (8 European countries) in second half of 2020 and the first half of 2021, it had the aim to explore the perception of the risk of COVID-19 and to examine the factors that influence the beliefs of the risk of COVID-19 of these people. 49% were labeled as skeptical of COVID-19 in terms of the likelihood of getting infected and 38% in terms of the harmful consequences of the disease. The factors influencing COVID-19 skepticism in these groups contribute to a better understanding of information disorder during crises and the ways in which it could be managed by policies against marginalization [19].

Low-income populations may have reduced access to health care, especially in countries without universal health care. In the United States, a survey was conducted on the risk, awareness of COVID-19 and the usefulness of an app to gain additional information regarding COVID-19. They came to the worrying conclusion that most respondents did not believe they were at risk of contracting COVID-19. Studying

these cultural or social differences was essential for global cooperation. After all identifying similarities between cultures reveals bridges that we can use to facilitate overcoming our differences [20].

A large number of studies have focused on the impact of social media use on preventive measures and behaviours taken by the population to protect themselves from COVID-19. For example, Allington's research claimed that conspiracy theories on COVID-19 on social media affected people's active behaviors, while television broadcast media served as a source of information for the public, which led to more preventive measures being taken by individuals [17, 21-23].

During the pandemic, many countries have established restrictive measures to limit the spread of Covid. Restrictions and bottlenecks imposed by the authorities have generated important social, economic and health disruptions. Health services were most affected by the challenges of an unknown disease, the lack of personal protective equipment, and, the need to reorganise infrastructure and human resources and the restrictions imposed on patients in healthcare facilities. Doctors have been affected by the pandemic, once on a personal level and also by the medical role, as frontline fighters with the rapidly spreading pandemic [24].

Romania reported the first cases on its western border at the end of February 2020. Although "patient zero" was identified early in Romania, by March 14 Romania exceeded 100 confirmed cases. Shortly thereafter, local transmission exceeded the number of imported cases. In response to the growing number of infections, a state of emergency was declared on March 16, under which certain rights such as freedom of movement were restricted and non-essential businesses were closed. On March 25, Romania increased these restrictions by instituting a military ordinance. The new measures included isolating citizens over the age of 65 in their homes and reducing the daily movement of the population to a minimum, such as shopping and essential visits to pharmacies or hospitals. Schools were closed on March 11, 2020. Universities, both public and private, were also closed and all activities were conducted online [11, 25, 26].

Restrictive measures have been taken in other countries as well. By imposing the blockage, the population was isolated at home and daily activity was restricted. Only essential services were in operation. Educational institutions, shops, restaurants, theatres and cinemas were closed. Governments recommended 'home work', as far as possible. But such measures can lead to various social problems, such as income reduction, job loss, domestic violence and limitations in the use of essential goods and services, difficulties in caring for people with medical problems due to the absence of caregivers, inaccessibility to health care that can lead to stress [27-29].

Several studies currently provide key evidence on the direct and indirect generalized effects of the COVID-19 outbreak and pandemic-related restrictions. Patterns of increased psychological distress, mental health sequelae, and maladaptive behaviors have been consistently reported in some countries [30, 31], and psychological challenges have been attributed in particular to pandemic-related blockage [32].

In our study, 76.2% of those with medical training but who do not work in the health system felt the limitations imposed by the context of the pandemic, but they were not significantly affected, while 27.6% of those working in the healthcare system claimed to have carried out their daily activities normally. The burden of restrictions was felt most among those without medical training at a rate of 17.3%.

Our study also followed the approach of vaccination and education programs. 57.1% of those who study/work in the medical field considered that mandatory vaccination was the only solution to overcome the pandemic. Of those without medical education, 56.7% considered compulsory vaccination as a form of abuse, while 24.4% declared themselves indifferent. All those with medical training, regardless of

whether they work in the health field, believed that there was a deficiency of basic medical knowledge among the native population. It should be noted that only 78% of those without medical education shared the same opinion. Regarding the same question, 98.1% of those who study/work in the field believe that it is absolutely necessary to implement health education programs in schools, 28.6% of those with medical education, but who do not work in the field, did not consider them a priority, and the only ones who consider them useless are those without medical education.

A Romanian study indicates that reluctance to receive vaccines continues to exist among medical and social personnel in Romania, and this hesitation might be mirrored in the general population's attitude towards vaccination [33].

In the EU, Romania is recognized as one of the most religious countries, boasting an Orthodox Christian majority of over 80%. Despite rapid responses from many major religions and Christian denominations in Europe to the pandemic, the European Orthodox Churches were comparatively slow to react, in part, due to their conservative doctrines [11].

National and international surveys troublingly suggest that at least 1 in 3 Romanians would refuse any form of vaccination against COVID-19 [12].

Our study shows that those with higher education voluntarily opted for vaccination. Post-high school graduates have vaccinated themselves due to the constraints felt due to the measures imposed by authorities. Among those who chose not to vaccinate, the highest percentage is found among primary school graduates, followed by those without formal education and post-high school graduates.

According to an Italian study a high percentage of participants (79.8%) expressed the need for both civil and criminal limitation of liability in connection with work in the management of *SARS-Cov-2* patients. The same results were obtained in our study [34].

5. Conclusions

The *SARS-CoV-2* virus, highly contagious and globally prevalent, has impacted diverse social strata. The Covid-19 pandemic has intensified variations in perceptions across different backgrounds, age groups, and between individuals in medical and non-medical roles.

A notable trend indicates that individuals in rural areas are more inclined to deny the existence of the Covid virus compared to their urban counterparts. Moreover, denial rates are elevated among those with lower educational attainment, encompassing high school/post-high school graduates, individuals with only primary education, or those lacking formal education. Conspiracy theories about the pandemic's origin found greater traction among those without medical education. This cohort demonstrated a predisposition towards a "counter-system" mindset, questioning both measures implemented by authorities and the corresponding statistics. Additionally, skepticism regarding Covid vaccines and the healthcare system was more pronounced within this demographic. In contrast, individuals with medical education exhibit heightened trust in measures enforced by authorities, official statistics, and vaccination campaigns. They are more receptive to embracing stringent pandemic control measures, such as mandatory vaccination or imposing stricter restrictions on the unvaccinated. Those with medical training unanimously acknowledged informational gaps in Romania concerning fundamental medical knowledge. A majority of this group endorsed the necessity of introducing health education programs into the school curriculum. Notably, such initiatives garnered robust support among young people, with 94.4% of those aged 12-24 expressing agreement. The Covid-19 pandemic has widened pre-existing disparities between healthcare professionals and the general population, complicating its management and fostering division into *"affirmatives"*

and *"deniers."* This divide, coupled with the general population's diminished trust in the Romanian state healthcare system, has further impeded the efforts of authorities and healthcare professionals in efficiently managing the new virus, exacerbating an already strained system.

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