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Social Perceptions of COVID-19 and Vaccinations: Survey Findings

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ORIGINAL ARTICLE

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Social perceptions of COVID-19 and vaccinations: survey findings

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ABSTRACT

Introduction: The COVID-19 pandemic can certainly be considered a turning point in history. In 2021 vaccines have finally arrived. They were met with different attitudes from people, from a willingness to be vaccinated as soon as possible to hostility. This study aimed to conduct a survey assessing public beliefs and attitudes towards vaccinations and COVID-19.

Material and methods: A survey was conducted online from January 13 to February 14, 2022. It was completed by 7025 adult participants. After screening for potential fraudulent responses, 7018 valid responses were included in the analysis.

Results: Among the concerns about vaccination, the most common reason for hesitation was the lack of information on long-term side effects, cited by 41.4% of the vaccinated. Doubts about vaccine effectiveness were reported by 15.9% of people, and fear of severe side effects was mentioned by 32.2%. For the unvaccinated, the most common affirmative response was the desire for a COVID passport, which 43.7% of individuals supported. Concerns about avoiding severe illness led 38.7% to hesitate, while 25.1% felt social pressure. Among the statements about vaccinations and COVID-19, unvaccinated individuals most commonly believe in the falsification of pandemic statistics, think that the time from vaccine development to deployment was too short, and fear that vaccines might cause serious side effects. In contrast, vaccinated individuals are more likely to believe in the severity of the disease and the effectiveness of vaccines.

Conclusions: The present findings indicate the need for increased focus on vaccine education. It is crucial to inform the public about where to access credible and verified information. Additionally, it is important to approach rumors and theories circulating on social media with skepticism. Developing and distributing educational materials, such as pamphlets and online resources, can help ensure the public has access to reliable health information.

Keywords: vaccination, COVID-19, SARS-CoV-2, vaccines hesitate, social perceptions, COVID-19 vaccination

Introduction

Since the outbreak of the COVID-19 pandemic in December 2019, the world has been grappling with a previously unknown virus, SARS-CoV-2, which quickly spread across the globe [1]. The disease it causes has a wide range of symptoms, ranging from mild ailments like fever and cough to severe complications such as pneumonia and respiratory failure syndromes [2]. Moreover, COVID-19 has been identified as a cause of serious thromboembolic issues, increasing the risk of complications among patients [3].

In response to this global pandemic, scientists and pharmaceutical companies accelerated efforts to develop COVID-19 vaccines. These vaccines, developed and rolled out at record speed, have become a crucial tool in the fight against the virus. The effectiveness of these vaccines in preventing severe cases of COVID-19 and reducing the risk of death has been confirmed by numerous clinical and observational studies [4–7].

However, despite the clear benefits of vaccination, their acceptance by society has been met with diverse reactions and concerns [8]. Some people fear the side effects of vaccines, although most of these effects are typically mild and transient. Others question the safety and efficacy of vaccines, based on misinformation or a lack of trust in scientific processes. There are also concerns about the speed at which vaccines were developed, though it should be noted that these processes were closely monitored and adhered to international safety standards [9].

In the face of such complex social reactions, research on perceptions and attitudes toward COVID-19 vaccines is crucial [10]. Understanding the motivations and barriers influencing individual and community decisions regarding vaccination allows for more effective shaping of health policies, as well as educational and communication strategies. This knowledge is essential to ensuring high levels of vaccine acceptance and expediting the return to normalcy while minimizing the pandemic's impact on global health and the economy.

This study aimed to conduct a comprehensive survey assessing public beliefs and attitudes towards vaccinations and COVID-19. This survey will evaluate participants' understanding and misconceptions regarding vaccines, particularly in the context of the COVID-19 pandemic. The study seeks to identify gaps in knowledge and educational deficiencies among patients, intending

to summarize these findings to develop targeted educational interventions. By analyzing the survey results, the aim is to highlight prevalent myths and misunderstandings, and ultimately, to improve public education strategies related to vaccination and COVID-19.

Participants and procedure

A survey was conducted using online channels between January 13 and February 14, 2022. The survey was completed by 7025 adult participants. The authors utilized social media channels such as Facebook and Twitter to disseminate the survey link, ensuring broad visibility and engagement. Additionally, they collaborated with the Polish Society of Lifestyle Medicine to include the survey in their newsletter. After screening for potential fraudulent responses, 7018 responses were included in the analysis. To be eligible for analysis, respondents had to be at least 18 years old and capable of completing the survey online. Seven responses were excluded due to answering in the wrong category, insincerity responses, or skipping answering the vaccination status question.

On September 11, 2023, the Bioethics Committee at the Medical University of Warsaw issued a statement acknowledging the research, which complies with the principles of research ethics and does not require separate approvals. The review number issued by the committee is AKBE/259/2023.

The study aimed to gather data on the opinions and attitudes of Polish individuals toward COVID-19 vaccinations in the context of the ongoing pandemic and its association with the rising number of infection cases in the country. The survey was structured to include questions covering the following areas:

1. Demographic information.
2. Lifestyle and chronic conditions.
3. Vaccination status.
4. Factors influencing the decision to vaccinate or not vaccinate.
5. Beliefs about COVID-19 and vaccinations.

Data collected through the survey were analyzed to identify main trends, differences in beliefs between vaccinated and unvaccinated groups, and potential factors influencing decisions regarding COVID-19 vaccination. The initial phase of the analysis has been published and is available [11].

Results

The study shows that most participants were vaccinated against COVID-19. Vaccinated individuals tended to be slightly older, with women making up a larger proportion of this group compared to men. Marital status appeared to influence vaccination rates, with married individuals more frequently vaccinated, while widowed participants showed a lower vaccination rate.

Education level also played a role: those with higher education were more likely to be vaccinated than those with vocational training. Differences in vaccination rates were observed based on place of residence, with individuals in large cities having higher vaccination rates compared to those in rural areas. Additionally, people with chronic health conditions were more often vaccinated than those without such conditions.

Statistically significant using the chi-square test ($p < 0.001$) are gender, educational status, and residence area.

The authors listed 17 statements that were found during the research of internet sources, social media posts, and PubMed articles regarding vaccinations and COVID-19 infection. Respondents were asked to answer each statement with "agree", "hard to say", or "disagree". The results are presented in Table 2 below, divided into vaccinated and unvaccinated individuals.

The chi-square test conducted investigated the statistical significance of beliefs related to COVID-19 vaccinations among two groups: vaccinated and unvaccinated participants. The results revealed significant differences in responses to various statements regarding vaccinations, with p-values indicating strong significance ($p < 0.001$). Notable beliefs included concerns about the vaccine causing COVID-19, altering DNA, and leading to milder illness after infection, as well as worries about vaccines containing harmful substances and the belief that vaccination could lead to infertility. These findings suggest that variations in vaccination beliefs are notable and may have important implications for health communication strategies.

Additionally, vaccinated individuals were asked if any of the listed factors caused them to hesitate before getting vaccinated against COVID-19. Among the listed statements, the most frequently marked reason for hesitation was the lack of information about the long-term side effects of the vaccine, with 2375 (41.4% of the vaccinated) indicating this concern. Doubts about the vaccine's effectiveness were cited by 910 (15.9% of the vaccinated), and fear of severe post-vaccination reactions was mentioned by 1849 (32.2% of the vaccinated). All the results of this section are presented in Graph 1.

Unvaccinated individuals were also asked if any of the listed factors caused them to hesitate about getting vaccinated. The overwhelming majority responded that none of the listed reasons caused them to hesitate. The most popular affirmative response was the desire to have a COVID passport (during the pandemic, only vaccinated individuals or those with a negative test could travel by plane), with 557 people (43.7% of the unvaccinated) giving this answer. To avoid severe illness, 494 (38.7% of the unvaccinated) hesitated about getting vaccinated. A significant number felt social pressure, with 320 (25.1% of the unvaccinated) indicating this. Interestingly, concerns about vaccination and vaccine safety were stronger for these respondents than their fear of the illness itself, which they also expressed. All the results of this section are presented in Graph 2.

Discussion

This is the third study in the series. The previous studies presented the factors associated with willingness to receive a COVID-19 vaccination and use Personal Protective Equipment and behavior against COVID-19 in the unvaccinated adult Polish population [11]. Again, a significant difference of opinion between vaccinated and unvaccinated people can be observed. In the series of questions, one can distinguish the most common profile of a given person in connection with his or her vaccination status.

Multiple studies have confirmed the effectiveness of vaccinations in the fight against the COVID-19 epidemic [12, 13], although they are not free from potential side effects [14]. In addition, new reports of possible adverse reactions are often publicized by the mass media. One of the recent media reports was the risk of thrombosis caused by some of the vaccines [15, 16]. It was widely commented on, both in Poland and around the world. While it has been proven that

the formation of blood clots is related to the use of vaccines, it should be noted that COVID-19 infection carries a much higher risk of thrombosis [17]. In the present study, the unvaccinated people showed less confidence in proper vaccine testing (2.4% vs. 60.2% among the vaccinated), as well as their safety in terms of possible side effects (72.5% vs. 22.7%) Those results are consistent with the review conducted in 2023, which showed that the most important factors associated with vaccine reluctance were concerns about the vaccine's safety and possible side effects as well as another study conducted in the USA [18, 19].

Over time, since their introduction, many conspiracy theories have arisen around vaccines [20]. In the present study, the unvaccinated people were more likely to believe that vaccines cause DNA alterations (11% vs. 1.3%) or contain microchips (3.1% vs. 0.1%). In addition, they showed less trust in the information provided by WHO (11.4% vs. 65.5%). This is reflected in another study that has linked trust in government media with belief in vaccine conspiracy theories and reluctance to get vaccinated [21]. Moreover, the mistrust in the information provided by the WHO was significantly greater among the unvaccinated individuals – in the cross-sectional study conducted in Lebanon only 33.6% of those unwilling to vaccinate often trusted the news from WHO, compared to 62.5% of those willing to take the vaccine [22]. Another misconception about the vaccine was that it could cause COVID-19 infection. It was most prominent among those who were unvaccinated (30.8% vs. 6.2%). This belief was correlated with the unwillingness to vaccinate in the Middle Eastern population [23]. An expression of distrust among the unvaccinated is also their frequent claim that statistics regarding the pandemic are falsified (60.2% vs. 17%) and that not all post-vaccination adverse events are recorded (84.3% vs. 36.4%). Other theories regarding vaccines include causing infertility (8.9% vs. 0.9%) and containing harmful substances (32.1% vs. 3.1%). As for the existence of the COVID-19 virus, the majority of both unvaccinated and vaccinated are convinced that it indeed exists (86.6% vs. 97.4%). Overall, people's belief that government sources of information are unreliable and their trust in conspiracy theories have been linked to reluctance to get vaccinated [24]. Many people choose social media over official sources for obtaining information, including those about vaccines [25]. However, this source was proven to be unreliable and misinformative [26]. The study conducted in the UK showed that those people have less knowledge about the severity of COVID-19 and they are less likely to vaccinate [27].

COVID-19 infection can pose a serious threat to people's lives and may lead to many medical complications [28]. The majority of the vaccinated people are aware of the risk of the disease — 91.5% consider it dangerous and 91.6% are convinced that it can lead to complications. The unvaccinated generally agree that the infection can have serious consequences (64% agree, 31.5% hard to say) although are not decisive whether COVID-19 is dangerous — for 46.6% it is, and for 42.8% it's hard to say. Fear of the virus can act as a motivation to vaccinate, as was proven in the study conducted in South Korea [29]. Corresponding results came from the study conducted in Saudi Arabia, where anxiety and fear were connected with lower vaccination hesitancy [30].

The vaccinated people showed a strong belief that getting COVID-19 after vaccination results in a milder illness (86.5% vs. 18.7% among unvaccinated). Moreover, they significantly more often agreed that vaccinating the population as quickly as possible will speed up the return to normal life (82% vs. 4.6%). This belief in the effectiveness of the vaccines has been linked to increased vaccination intention in the study conducted in the USA [31].

Lastly, the spread of the pandemic has prompted governments to implement many new rules and regulations to limit the spread of the virus. These included the introduction of immunity passports [32]. They raised ethical doubts and constituted an organizational and legal challenge [33]. They were also met with mixed reactions from the public [34] with many feeling forced to get the vaccine [35]. However, along with vaccinations, they raised hopes for a quick recovery of air traffic and tourism [36]. In the present study, the most common factor in vaccine hesitancy among unvaccinated people was the prospect of having a Covid passport (43.7%). The promise to ease restrictions on vaccinated people has generally had a positive impact on people's willingness to get vaccinated [37], especially among travelers [38].

Limitations

The main limitations of the study include the use of an online survey method, which may have only reached individuals proficient in using computers and the internet, and their families. There is no way to verify the truthfulness of the responses based on the respondent's self-report. Additionally, there is a notable demographic discrepancy among the respondents; the survey predominantly reached younger individuals from large cities and mainly females.

Conclusions

Overall, the main factors differentiating vaccinated from unvaccinated people can be distinguished. The vaccinated showed greater faith in the safety and effectiveness of vaccines, were more willing to trust information from WHO, and were also more aware of the threat posed by the virus. Unvaccinated people, on the other hand, showed mixed feelings of fear of infection, were distrustful, believed less in the effectiveness of vaccines, and more often in the false theories about them. An additional motivation for vaccination among unvaccinated people was the prospect of receiving an immunity passport. The present findings show that more emphasis should be placed on vaccine education. It is also very important to provide knowledge about where to find reliable and verified information. It is also important to treat rumors and theories on social media with caution. It should be emphasized how important it is to verify them because not everything written on the Internet is true.

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Table 1. Participant's characteristics

Variable		Vaccinated against COVID-19 [n = 5742, 81.82%]	Unvaccinated against COVID-19 [n = 1276, 18.18%]
Mean age [SD]		31 (18–75)	30 (18–73)
Gender	Male [n = 1575, 22.44%]	1236 (78.48%)	339 (21.52%)
	Female [n = 5396, 76.89%]	4466 (82.77%)	930 (17.23%)
	Do not specify [n = 47, 0.67%]	40 (85.11%)	7 (14.89%)
Marital status	Married [n = 2916, 41.55%	2417 (82.89%)	499 (17.11%)
	Single [n = 2054, 29.27%]	1629 (79.31%)	425 (20.69%)
	Divorced [n = 227, 3.23%]	186 (81.94%)	41 (18.06%)
	Widow [n = 13, 0.19%]	9 (69.23%)	4 (30.77%)
	Cohabitation [n = 1808, 25.76%]	1501 (83.02%)	307 (16.98%)
Education status	Higher [n = 5087, 72.49%]	4258 (83.70%)	829 (16.30%)
	Middle [n = 1764, 25.14%]	1369 (77.61%)	395 (22.39%)
	Primary [n = 28, 0.40%]	25 (89.29%)	3 (10.71%)
	Basic vocational [n = 60, 0.85%]	35 (58.33%)	25 (41.67%)
	Lower secondary [n = 79, 1.13%]	55 (69.62%)	24 (30.38%)

		Vaccinated	Unvaccinated
	Industry [n = 711, 10.13%	574 (80.73%)	137 (19.27%)
	Agriculture [n = 41, 0.58%]	30 (73.17%)	11 (26.83%)
	Unemployed [n = 975, 13.89%]	793 (81.33%)	182 (18.67%)
Residence area	Up to 50,000 [n = 925, 13.18%]	722 (78.05%)	203 (21.95%)
	50,000–150,000 [n = 846, 12.05%]	622 (73.52%)	224 (26.48%)
	150,000–500,000 [n = 1158, 16.50%]	941 (81.26%)	217 (18.74%)
	More than 500,000 [n = 3170, 45.17%]	2745 (86.59%)	425 (13.41%)
	Village [n = 919, 13.09%]	712 (77.48%)	207 (22.52%)
Chronic comorbid	Yes [n = 3729, 53.13%]	3170 (85.01%)	559 (14.99%)
	No [n = 3289, 46.87%]	2572 (78.20%)	717 (21.80%)

Table 2. Beliefs about COVID-19 and vaccination

Variable		Vaccinated against COVID-19 [n = 5742, 100%]		Unvaccinated against COVID-19 [n = 1276, 100%]	
Not enough time has passed to properly test the vaccines	Agree	732	12.75%	1037	81.27%
	Hard to say	1556	27.10%	208	16.30%
	Disagree	3454	60.15%	31	2.43%
Vaccines can cause serious side effects	Agree	1306	22.74%	925	72.49%
	Hard to	2067	36.00%	325	25.47%

Statement	Response				
	say				
	Disagree	2369	41.26%	26	2.04%
WHO guidelines are a trusted source of information	Agree	3761	65.50%	145	11.36%
	Hard to say	1533	26.70%	636	49.84%
	Disagree	448	7.80%	495	38.79%
You can get COVID-19 from the vaccine	Agree	356	6.20%	393	30.80%
	Hard to say	596	10.38%	437	34.25%
	Disagree	4790	83.42%	446	34.95%
Vaccines alter DNA and/or genetic code	Agree	74	1.29%	140	10.97%
	Hard to say	383	6.67%	475	37.23%
	Disagree	5285	92.04%	661	51.80%
Getting COVID-19 after vaccination results in a milder illness	Agree	4966	86.49%	239	18.73%
	Hard to say	650	11.32%	701	54.94%
	Disagree	126	2.19%	336	26.33%
Vaccines contain microchips	Agree	43	0.75%	39	3.06%
	Hard to say	126	2.19%	209	16.38%
	Disagree	5573	97.06%	1028	80.56%
COVID-19 disease can lead to serious complications	Agree	5261	91.62%	816	63.95%
	Hard to say	269	4.68%	402	31.50%
	Disagree	212	3.69%	58	4.55%
Pandemic statistics are falsified	Agree	976	17.00%	768	60.19%
	Hard to say	2469	43.00%	415	32.52%
	Disagree	2297	40.00%	93	7.29%

Not all adverse vaccine reactions are recorded	Agree	2087	36.35%	1075	84.25%
	Hard to say	2689	46.83%	182	14.26%
	Disagree	966	16.82%	19	1.49%
Vaccines contain harmful substances	Agree	175	3.05%	410	32.13%
	Hard to say	1432	24.94%	728	57.05%
	Disagree	4135	72.01%	138	10.82%
COVID-19 disease is not dangerous	Agree	98	1.71%	136	10.66%
	Hard to say	393	6.84%	546	42.79%
	Disagree	5251	91.45%	594	46.55%
Vaccinating the population as quickly as possible will speed up the return to normal life	Agree	4711	82.04%	59	4.62%
	Hard to say	703	12.24%	380	29.78%
	Disagree	328	5.71%	837	65.60%
Vaccination leads to infertility	Agree	54	0.94%	113	8.86%
	Hard to say	942	16.41%	862	67.55%
	Disagree	4746	82.65%	301	23.59%
The SARS-CoV-2 virus does not exist	Agree	36	0.63%	25	1.96%
	Hard to say	115	2.00%	146	11.44%
	Disagree	5591	97.37%	1105	86.60%

Figure 1. Factors caused to hesitate before getting vaccinated (the number of people who selected "YES")
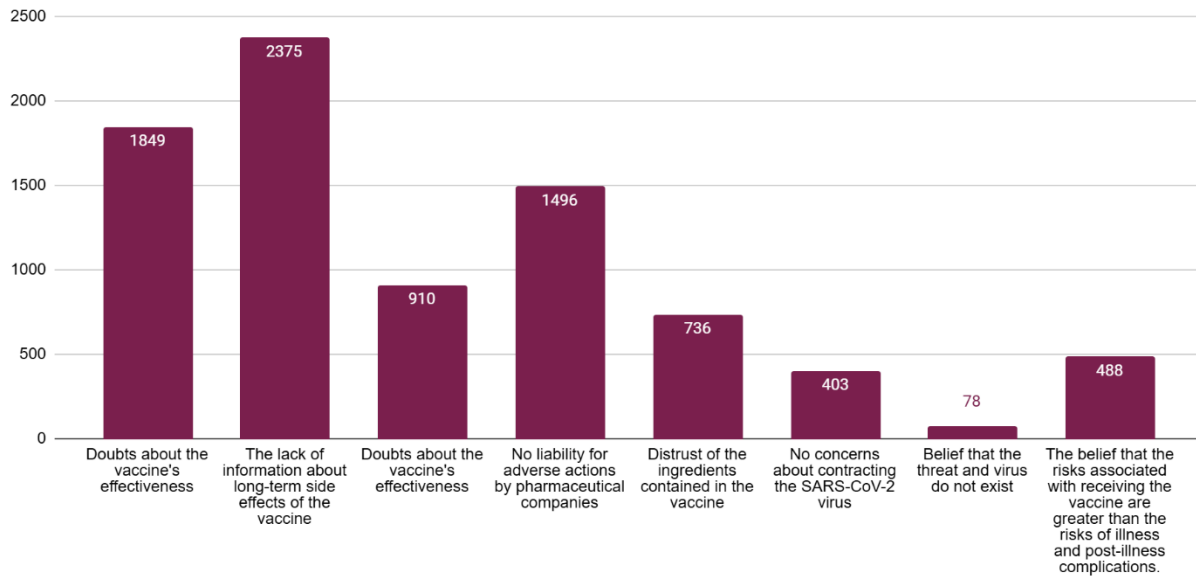
Figure 2. Factors caused to hesitate about getting vaccinated (the number of people who selected "YES")