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REASONS AND DETERMINANTS OF DISTRUST IN THE COVID 19 VACCINE

Abstract: Introduction: Distrust in the COVID 19 vaccine is a global public health problem. It is conditioned by doubt in the effectiveness of the vaccine, fear of unpredictable future effects of the vaccine and preference for natural immunity.

Objective: The aim of the study was to evaluate the predictors of distrust in the COVID 19 vaccine in the unvaccinated adult population, and to determine their conditionality by sociodemographic factors.

Methods: The research, as an epidemiological cross-sectional study, was conducted at the Health Center Krupa na Uni from 15.03. 2021. to 15.05.2022. The study sample consisted of 174 people, 78 women and 96 men with an average age of 54.8 ± 13.43 years. The research instrument was a socio-demographic questionnaire and a questionnaire for determining attitudes about vaccinations. Student statistical t-test and ANOVA test were used in statistical data analysis

Results: 83.33% of respondents believed in the ability of the vaccine to provide protection against clinically manifest disease, 61.49% from asymptomatic infection, and 59.77% from serious complications of the disease. 94.40% of respondents thought that vaccines would have side effects in the future, 99.33% that there were undetected side effects, 90.23% that it would result in side effects in children. 90.23% of respondents believed in greater safety of natural immunity, 88.51% in longer duration, and 57.48% in higher efficiency.

Conclusion: Extremely high distrust in vaccine safety was the most important provision in respondents' decision not to be taken COVID 19 vaccine. On the other hand, just over half of respondents believed that the vaccine protected against serious complications of the disease and considered natural immunity more effective than COVID 19 vaccine. Apart from the slightly higher efficiency of the vaccine in university-educated and employed respondents, sociodemographic factors did not have a statistically significant effect on the attitudes of respondents about the COVID 19 vaccine.

Keywords: vaccination, COVID 19, rejection, distrust

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INTRODUCTION

Severe acute respiratory syndrome caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) coronavirus is a newly discovered respiratory tract disease designated as coronavirus disease 2019 or COVID 19 (coronavirus disease 2019) (1). It is the third circulating disease in the world caused by coronavirus (CoV), along with the already known severe acute respiratory syndrome (SARS-CoV) and Middle Eastern respiratory syndrome (MERS-CoV) (1). The first officially registered case of infection was recorded in the city of Wuhan (Hubei Province, PRC) on December 31, 2019, while a pandemic was declared on March 11, 2020 (2,3).

So far developed COVID-19 vaccines based on different platforms (inactivated vaccines, vaccines containing pathogen antigens obtained by recombinant DNA technology, vector vaccines, RNA and DNA vaccines) provide very good protection against clinically manifest disease, especially from its more severe forms with inevitable hospitalization and possible death (4).

Distrust in the COVID 19 vaccine is a global public health problem (5). It arises as a result of the complex interaction of various personal, social, cultural and political factors (6). Vaccination reservations and refusals are conditioned by doubts about the effectiveness of the vaccine, fear of unpredictable future effects of the vaccine, and preference for innate immunity (7). An important role in their development is played by a strong anti-vaccine movement, the presence of various unfounded myths and conspiracy theories in public space (4).

OBJECTIVE

The study aimed to assess the predictors of distrust in the COVID 19 vaccine (doubt about the effectiveness of the vaccine, fear of unpredictable future effects of the vaccine and predisposition to natural immunity) in unvaccinated adults and determine their conditionality by sociodemographic factors.

METHODS

The research, as an epidemiological cross-sectional study, was conducted in a period of 60 days, from 15.03. 2021. to 15.01.2022. The study sample (respondents) consisted of 174 persons, heterogeneous socio-demographic and health characteristics selected by random selection, who reported to the family medicine clinic for examination or administrative reasons, as well as persons who accompanied them. The study included people who had not been vaccinated against COVID 19, aged over 20, with a minimum of primary education, completed primary school (to better understand the

questionnaire). The study did not include people vaccinated against COVID 19, with diagnosed psychotic disorder, malignant and advanced chronic diseases.

Data were collected with a socio-demographic questionnaire developed for research purposes and a specific questionnaire to determine attitudes about vaccination. The socio-demographic questionnaire determined the gender, age, marital status, education and employment status of the respondents. The questionnaire for determining attitudes towards vaccination consisted of three domains: distrust in the effectiveness of the vaccine, concern about the unpredictable future effects of the vaccine and preferences for natural immunity. Each domain had three questions. Respondents had five answers to each question (the questionnaire was designed on the principle of a five-point Likert scale). The best possible answer was 5, and the wrong one was 1. The sum of grades for each domain of the questionnaire was calculated for each respondent. For the purposes of the research, a domain in the field of vaccine efficacy was created, while domains in the remaining two areas were taken from the Vaccination Attitudes Examination (VAX) Scale (8).

Student's t-test and ANOVA test were used to determine statistical significance. The significance level is set to 95% confidence interval. The results are presented textually and tabularly, and the complete paper is processed in a word processor Microsoft Word for Windows.

RESULTS

The study involved 174 people who were not vaccinated against COVID 19. Among them were 78 women and 96 men with an average age of 54.8 ± 13.43 years (the youngest respondent was 22 years old, the oldest 84 years old). 125 participants in the research graduated from high school, 19 from primary school, while 30 participants had a university degree. There were 78 respondents in employment, 96 were unemployed. 123 respondents lived in marriage (extramarital union), 51 not married (extramarital union) (Table 1).

Table 1. Participants' sociodemographic characteristics (N = 174)

Participants' sociodemographic characteristics		No (%)
Gender	Women	78 (44,83%)
	Men	96 (55,17%)
Age (years)	20-40	36 (20,69%)
	40-60	79 (45,40%)
	60-80	54 (31,03%)
	> 80	5 (2,87%)

Level of education	Primary school	19 (71,84%)
	High school	125 (71,84%)
	College	30 (17,24%)
Employed	Yes	78 (44,83%)
	No	96 (55,17%)
Marital status	Married or extramarital union	123 (70,69%)
	Not married or extramarital union	51 (29,31%)

Most of the participants in the research thought that the vaccine was not efficacy. A high 83.33% of respondents expressed doubts about the efficacy of the vaccine in protecting against clinically manifest disease. A slightly lower percentage of respondents felt that the vaccine was not effective in protecting against asymptomatic infection (61.49%) and serious complications of the disease (59.77%). On the other hand, 21.27% of respondents believed that the vaccine provides protection against serious complications of the disease. The percentage of respondents who believed in protection against asymptomatic infection (12.07%) and clinically manifest (4.60%) disease was significantly lower (Table 2). There was no statistically significant difference in attitudes about vaccine efficacy in relation to gender ($p = 0.05$), age ($p = 0.05$) and marital status ($p = 0.68$). Significantly higher confidence in the efficacy of the vaccine had respondents with a university degree ($p = 0.004$) as well as respondents who were employed ($p = 0.046$).

Table 2. Attitudes towards efficacy COVID-19 vaccine among the participants

ANSWER	EFFICACY OF THE COVID-19 VACCINE		
	Protection against asymptomatic infection	Protection against clinically manifest diseases	Protection against serious complications of the disease
Incorrect answer	79 (45.40%)	105 (60.34%)	143 (82.18%)
Probably incorrect	66 (37.93%)	52 (29.89%)	23 (13.22%)
I do not know	20 (11.49%)	19 (8.05%)	8 (4.60%)
Correct	9 (5.17%)	1 (1.72%)	0 (0.00%)
Probably the correct	0 (0.00%)	(0.00%)	0 (0.00%)

Distrust in the safety of the vaccine was the most important provision in the respondents' decision not to be vaccinated against COVID 19. Among the participants in the study was the opinion that vaccines will have side effects in the future (82.18%,

probably 13.22%) and result in side effects in children. exactly 60.34%, probably exactly 29.89%). A slightly lower percentage of respondents thought that there were undetected side effects (exactly 45.40%, probably exactly 37.93%) (Table 3). There was no statistically significant difference in attitudes about vaccine safety in relation to gender ($p = 0.50$), age ($p = 0.14$), education ($p = 0.41$), employment ($p = 0.40$) and marital status ($p = 0.23$).

Table 3. Attitudes towards safety COVID-19 vaccine among the participants

ANSWER	SAFETY OF THE COVID-19 VACCINE		
	Worries about unforeseen effects	Worries about unforeseen effects in children	Worries about unforeseen effects in future
Incorrect answer	79 (45.40%)	105 (60.34%)	143 (82.18%)
Probably incorrect	66 (37.93%)	52 (29.89%)	23 (13.22%)
I do not know	20 (11.49%)	19 (8.05%)	8 (4.60%)
Correct	9 (5.17%)	1 (1.72%)	0 (0.00%)
Probably the correct	0 (0.00%)	(0.00%)	0 (0.00%)

Respondents predominantly believed that natural immunity has greater safety (exactly 49.43%, probably true 40.80%) and longer duration (exactly 59.20%, probably true 29.31%) than the vaccine against COVID 19. Significantly fewer respondents believed that natural immunity more effective than the COVID 19 vaccine (exactly 43.68%, probably exactly 13.79%) (Table 4). There was no statistically significant difference in attitudes about the preference for natural immunity in relation to gender ($p = 0.55$), age ($p = 0.43$), education ($p = 0.087$), employment ($p = 0.22$) and marital status ($p = 0.87$).

Table 4. Preference for natural immunity against COVID-19 vaccine among the participants

ANSWER	PREFERENCE FOR NATURYL IMMUNITY		
	Longer length of natural immunity	Higher efficacy of natural immunity	Higher security of natural immunity
Incorrect answer	103 (59.20%)	76 (43.68%)	86 (49.43%)
Probably incorrect	51 (29.31%)	24 (13.79%)	71 (40.80%)
I do not know	19 (10.92%)	34 (19.54%)	9 (5.17%)
Correct	1 (0.57%)	36 (20.69%)	8 (4.60%)
Probably the correct	0 (0.00%)	4 (2.30%)	0 (0.00%)

DISCUSSION

Vaccination-related hesitation is present worldwide and represents one of the ten leading threats to global health (9). The main reasons for hesitation with vaccination against COVID 19 include doubts about the efficacy of vaccines, concerns about the unpredictable future effects of the vaccine, and belief in the superiority of natural immunity (10).

Available vaccines against COVID-19 provide very good protection against clinically manifest disease, especially from its more severe forms with unavoidable hospitalization and possible death, and there are indications that at least some of them provide considerable protection against asymptomatic SARS-CoV-2 infection (4). On the other hand, the strong anti-vaccine movement, the presence of various unfounded myths and conspiracy theories in public space has caused distrust in their effectiveness and safety (4).

Most of the participants in the research thought that the vaccine was not effective. A high 83.33% of respondents expressed doubts about the effectiveness of the vaccine in protecting against clinically manifest disease. A slightly lower percentage of respondents felt that the vaccine was not effective in protecting against asymptomatic infection (61.49%) and serious complications of the disease (59.77%).

Multiple mutations in the SARS-CoV-2 virus, too short duration of immunity after vaccination, and uncertainty about the conditions under which the vaccine was developed, stored, and transported raise doubts about its efficacy (11). Multiple studies in India have found a high degree of distrust in the efficacy of the vaccine against COVID 29 (41.3% -75.5%) (9). About 63% of study participants in the United States and 50% of study participants in Jordan had doubts about the effectiveness of the vaccine (9,12,13). Among 41% of respondents in Turkey, the opinion was that the effectiveness of vaccination has not been sufficiently tested, while 19.5% expressed uncertainty about the effectiveness of the vaccine (6). The “3Cs” model developed by American authors (self-confidence, self-efficacy, and suitability as major determinants of hesitation) highlights a lack of confidence in vaccine efficacy as the most common reason for vaccine rejection (14). Research in the United States has found that the readiness of adults to be vaccinated against COVID 19 increases with the effectiveness of the vaccine (13).

Distrust in the safety of the vaccine was the most important provision in the decision of the respondents not to be vaccinated against COVID 19. Among 95.40% of participants, the opinion was that the vaccine will have side effects in the future, while 90.23% of participants thought the vaccine had side effects. in children. A slightly lower percentage, 83.33%, of the respondents thought that there were undetected side effects.

New vaccines based on mRNA as a new technology have been accepted with some skepticism and claims that they can change human DNA (5,12). Conspiracy

theories (the link between vaccines and autism, cerebral palsy and other diseases), as well as the speed of vaccine development and registration in less than a year, have mediated the development of doubts about safety and long-term effects (5,12). Among 83% of participants in the study in the United States, the opinion was that the vaccine against COVID 19 was unsafe (15). Concerns about vaccine safety have been identified as the most significant predictor of vaccine rejection in another study by American authors (13). A study conducted in Malaysia showed great concern about the side effects of the vaccine, 95.8% of respondents (16). A study in Saudi Arabia found fear of unpredictable future effects of the vaccine in 79.9% of respondents (17). In a joint study by American and Canadian authors, participants' concern for vaccine safety was statistically significantly related to the decision to reject it (7). In a study by Egyptian authors, 51.8% of respondents showed high concern about the unexpected future effects of the vaccine, and 40.3% expressed moderate concern (8).

Respondents predominantly believed that natural immunity has greater security. Respondents predominantly believed that innate immunity had greater safety (90.23%) and longer duration (88.51%) than the COVID 19 vaccine. A significantly smaller number of respondents believed that innate immunity was more effective than the COVID 19 vaccine. 57.48%).

Despite the fact that SARS-CoV-2 virus infection is associated with a significant share of long-term complications but also deaths, there is a belief among adults who have not been vaccinated that achieving natural immunity through infection is less risky than vaccination (18). In a study by Italian authors, 84.0% of respondents believed in the superiority of natural immunity (19). A study in Qatar found a preference for natural immunity in almost 50% of participants (20).

Respondents with a university degree as well as respondents who were employed had significantly higher confidence in the efficacy of the vaccine. Socio-demographic factors did not have a statistically significant effect on respondents' attitudes about the safety of the vaccine against COVID 19 and the preferences of the subjects' natural immunity.

Although there are no gender differences in attitudes towards the COVID 19 vaccine, men are considered to be confident in their decision to vaccinate while women show a significant degree of hesitation in it (21). In developed countries, there is significantly less hesitation with vaccination among highly educated adults (21). On the other hand, in countries with below-average per capita incomes, there may be an inverse link between education and trust in the vaccine (21).

A study by Italian authors found that people with higher education have a significantly more positive attitude towards vaccination (19). A study in the United States came up with similar results (significantly positive attitudes of respondents with higher education and higher annual income before tax) (13). On the other hand, a study in Egypt found a statistically significant association of vaccination against the COVID

19 vaccine with postgraduate education, marital union, and work in the public sector (8). Research in Iran has found a significantly more positive attitude towards vaccination in respondents over the age of 60 (11). A study by Malaysian authors had an identical outcome (5). A study in Saudi Arabia found that the negative association of the COVID-19 vaccine trust with females, ages 34 to 49, marital union, employment, lower education, and urban residence (22).

CONCLUSION

Distrust in the safety of the vaccine was the most important provision in the decision of the respondents not to be vaccinated against COVID 19. Most respondents did not believe in the effectiveness of the vaccine in protecting against clinically manifest disease and considered natural immunity safer and longer lasting than the vaccine against COVID 19. Half of the respondents believed that the vaccine protects against serious complications of the disease and considered that natural immunity is more effective than vaccination against COVID 19. Respondents with university education as well as employees who were employed had significantly more confidence in the vaccine's effectiveness. Socio-demographic factors did not have a statistically significant effect on respondents' attitudes about the safety of the vaccine against COVID 19 and the preferences of the subjects' natural immunity.

RESEARCH LIMITATIONS AND RECOMMENDATIONS

Despite the relatively small sample and design of the cross-sectional study, the research helps to understand the main determinants of distrust in the COVID 19 vaccine and the possibility of identifying socio-demographic descriptors of distrust. Improving the vaccination process against COVID 19 requires a multidisciplinary, uniform approach at all levels of the education and health systems, relevant ministries, the wider community, the media and the pharmaceutical industry.

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