



Qualitative evaluation of reasons for healthcare professionals being unvaccinated against COVID-19

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Abstract

Background and Aim The importance of immunization has increased even more during the pandemic. This study aimed to evaluate the reasons for healthcare professionals not being vaccinated against COVID-19 and to develop solutions for the causes.

Subject and Methods This qualitative study was carried out with in-depth interviews between July 2021 and October 2021, with 32 healthcare professionals and five key people who had never been vaccinated against COVID-19.

Results The most common reasons that healthcare professionals were not vaccinated against COVID-19 were concerns about vaccine side effects, believing that the vaccine is not effective, distrust of the vaccine content and COVID-19 treatment methods, the rapid production of the vaccine, the fact that the vaccine is produced with a new technology, thinking that the vaccine is not the definitive solution, seeing themselves as healthy and young, and the belief that they would have a mild case of the disease and recover. The main themes were COVID-19 vaccine-related reasons, individual reasons/group effects, contextual reasons, and vaccination-related general issues. The main sub-themes were vaccine production, distrust, risk perception, policies and infodemic.

Conclusion It has been seen that the uncertainty, infodemic, and insecurity that emerged especially during the pandemic period are related to each other. As knowledge and awareness about the disease increase, there is an increase in risk perception. For this reason, social information studies should be increased and physicians should be enabled to use media tools more effectively.

Keywords Vaccine hesitation · Healthcare professional · COVID-19 vaccines · Qualitative · Pandemic

Key points Rapid vaccine production, side effects, thinking that it would not be effective, belief that data were insufficient/inappropriate, overcoming a mild case of the disease, thinking that they were healthy, distrust in the health system, and conspiracy theories were the most highlighted reasons to be unvaccinated against COVID-19.

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Introduction

Healthcare professionals have worked on the front lines all over the world during the pandemic. The Occupational Health and Safety Administration stated that healthcare workers are in the high-risk group in the COVID-19 pandemic (Department of Labor Occupational Safety and Health Administration 2022). The COVID-19 pandemic has placed a huge burden on healthcare systems at the global level (Cetintepe and İlhan 2020). Vaccination rates are important for the long-term control of the disease globally (Zhang et al. 2021).

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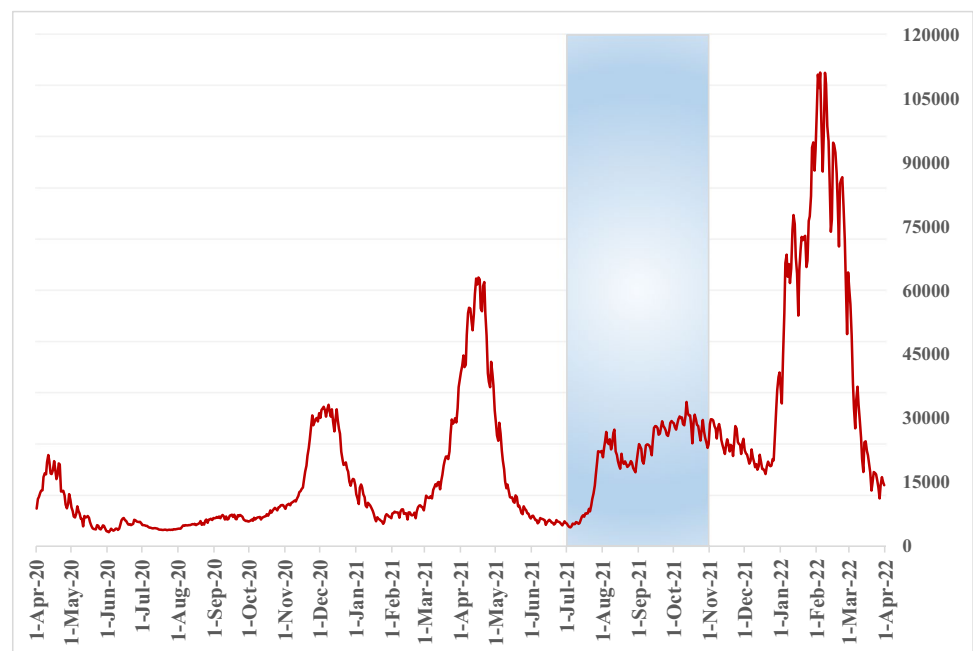
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Vaccine hesitation among healthcare professionals is a global problem (To et al. 2016). Healthcare professionals have been considered as a group that should be emphasized due to many factors such as being in the most reliable group to provide information about vaccines and being expected to be a role model for society by being vaccinated. On the other hand, although there are many quantitative studies on COVID-19 vaccine acceptance and rejection, qualitative studies are scarce. A search of the keywords *Healthcare*, *Qualitative*, *COVID*, *Vaccine*, and *Hesitation* in the Google Scholar and PubMed databases revealed a limited number of articles containing these keywords. “Vaccination hesitation-vaccine rejection” is a complex, multilayered, social behavioral phenomenon (World Health Organization 2014). For this reason, when examining the reasons for vaccine hesitation-vaccine rejection, qualitative research methods that offer a versatile and detailed evaluation are needed (Baltaci 2019). This study aims to evaluate the reasons for not getting the COVID-19 vaccine among health professionals working at a central hospital in Istanbul and to offer solutions for the identified reasons.

Methods

This is a descriptive study using qualitative research techniques (phenomenology). The research was carried out at a central hospital in Istanbul. The study data were collected over 4 months between July 2021 and October 2021. The blue line in Fig. 1 shows the number of cases in Turkey, and the shaded area shows the period of the study.

Fig. 1 Number of COVID-19 cases in Turkey (red line) and period of the study (blue bar)



Sample group

The study sample consisted of health professionals who had never been vaccinated against COVID-19. It included 32 people selected by the maximum-diversity sampling method, which is determined based on the duties of the individuals, their work status in the COVID-19 clinic, and the units they work in, and the sampling was terminated when data saturation was reached. By visiting the departments, the researcher of the study reached people who had never been vaccinated against COVID-19. Participants consisted of medical doctors (physicians), nurses, and other health professionals (such as security guards, data loggers, secretaries, cleaning staff, physiotherapists) (Table 1). In addition, five people who were key people in the vaccination program were reached from the medical, surgical, nursing, directorate, and faculty dean units.

Inclusion and exclusion criteria

The inclusion criteria for the study were as follows: the participant was a health professional at a central hospital in Istanbul at the time the research was conducted, and volunteered to participate in the study. The exclusion criteria were having received the COVID-19 vaccine or not having been vaccinated due to contraindication to the vaccine.

Data collection method

Sociodemographic data, gender, age, education level, time working in the profession, department, position, and working

Table 1 Main characteristics of participants

Code name	Profession	Age, years	Gender	Working in the COVID-19 clinic	Department	Working time in the profession, years	Educational status
K1	Physician	42	Male	Yes	Medical	4	University
K2	Physician	35	Female	Yes	Medical	4	University
K3	Physician	27	Female	Yes	Medical	3	University
K4	Nurse	22	Female	Yes	Medical	2	High school
K5	Nurse	26	Female	Yes	Medical	2,5	University
K6	Nurse	22	Female	Yes	Medical	3	High school
K7	Nurse	34	Female	Yes	Medical	12	University
K8	Other health professional	36	Male	Yes	Medical	22	Primary
K9	Other health professional	29	Male	Yes	Medical	1	College
K10	Other health professional	40	Female	Yes	Medical	6	High school
K11	Physician	29	Male	Yes	Surgical	2,5	University
K12	Physician	26	Male	Yes	Surgical	1,5	University
K13	Nurse	22	Female	Yes	Surgical	1	High school
K14	Nurse	22	Male	Yes	Surgical	1	High school
K15	Other health professional	43	Male	Yes	Surgical	13	High school
K16	Other health professional	32	Male	Yes	Surgical	11	Primary
K17	Physician	28	Female	No	Medical	3	University
K18	Physician	30	Female	No	Medical	5	University
K19	Physician	26	Male	No	Medical	2	University
K20	Physician	30	Male	No	Medical	4	University
K21	Physician	29	Male	No	Medical	5	University
K22	Nurse	41	Female	No	Medical	21	University
K23	Nurse	23	Male	No	Medical	1	College
K24	Nurse	24	Female	No	Medical	2	University
K25	Other health professional	43	Female	No	Medical	15	Primary
K26	Other health professional	32	Female	No	Medical	11	University
K27	Other health professional	30	Male	No	Medical	10	College
K28	Physician	32	Male	No	Surgical	8	University
K29	Nurse	23	Female	No	Surgical	1	High school
K30	Nurse	21	Male	No	Surgical	1	High school
K31	Other health professional	39	Female	No	Surgical	6	College
K32	Other health professional	35	Male	No	Surgical	16	University

status in the COVID-19 clinic were recorded for all participants. Semi-structured interview questions were created after a detailed literature review and were developed with the recommendations of two research assistant doctors and two lecturers in the field of public health. The evaluation was made by conducting a pilot interview. An in-depth face-to-face interview technique was applied with semi-structured open-ended questions. In-depth interviews were conducted with five key people using a semi-structured interview form.

All interviews were conducted by the principal researcher (ENK), who is a female medical doctor (MD) in public health residency. The researcher has had no relationship with participants before, during, or after the study. The participants were informed about the study, and the researcher introduced herself and explained the aim of the study and the data collection

(interview) procedure. All interviews were conducted in participants' work clinics, and only the participant and researcher were present during the interview. The researcher took field notes during interviews if needed. None of the interviews needed to be repeated. All interviews were audio-recorded with the participants' permission. The duration of interviews was up to 30 minutes.

Data analysis

Audio recordings were deciphered and transcripts were obtained in Word format. These transcripts were read by the researcher and returned to the participants for comment and/or correction. The codes were then determined. The coding was reviewed and evaluated, and themes were created from the codes collected in

a similar framework using the inductive qualitative evaluation method. Thematic content analysis was conducted and evaluated using the MAXQDA program with qualitative analysis methods.

The data were coded by two researchers and then validated by comparative evaluation. During the writing of the research findings, citations were given as much as possible, and the reader was given the opportunity to judge the consistency and validity of the conclusions reached with the findings.

Results

The code name, profession, age, gender, working status in the COVID-19 clinic, department, duration of work in the profession, and education status of the participants are shown in detail in Table 1.

The four main themes and their sub-themes for the reasons for not vaccinating against COVID-19 were extracted from the coded data (Table 2).

1. REASONS DUE TO COVID-19 VACCINE AND VACCINATION

(a) Distrust

It was determined that the greatest anxiety experienced by the participants about the COVID-19 vaccines was the lack of sufficient scientific data on the side effects of the vaccines used, especially on the long-term side effects. Some participants stated that they were afraid of side effects such as myocarditis, autoimmune diseases, inability to have children, or the possibility of other long-term effects that are not yet known. For this reason, they decided to wait for a while, even though they were in the high-risk group, to observe the side effects that may occur.

...I think that the side effects of the vaccine will appear in the future. So not now, but in a few years. We got an extra virus in our body. Let's see what will happen. People will see it in the future... (K31-Other health professional, 39 years old, 6 years in profession)

Although the study results of the vaccines were published at the time of the study, some of the interviewees stated that they thought that the study data for COVID-19 vaccines were not yet sufficient.

Some of the interviewees thought that the COVID-19 vaccines are ineffective, and it was seen that the extra doses reinforce the belief that the vaccine is ineffective.

...If it had been so effective, they wouldn't have taken out the third dose either. First, they said two doses, one and two, then they looked at it which was not very effective, so they made the third dose. They even cross

now. So it's not very effective. (K31-Other professional, 39 years old, 6 years in profession)

Some participants mentioned that they felt like volunteer subjects because they thought that the results of the COVID-19 vaccine studies were unreliable.

...Because there is no proven data yet, I think that everyone who has been vaccinated voluntarily participated in this study. After all, there are no results, data, or statistics. Frankly, I did not want to voluntarily try a vaccine with an uncertain outcome... (K6-Nurse, 22 years old, 3 years in profession)

Distrust in COVID-19 treatments and the content of vaccines increases the rate of non-vaccination.

...So it is not possible for people to not have a question mark against the vaccine. First, we gave Plequanel, now we banned it. First, there was favipiravir, now there is no need for it...So this confuses people... (K28-Physician, 32 years old, 8 years in profession)

Before the administration of the messenger RNA (mRNA) vaccine, a form called “mRNA COVID-19 Vaccine Application Information and Consent Form” is signed. This situation created doubts in the decision of some participants to be vaccinated.

(b) Vaccine production

During the pandemic period, the phases of vaccine development studies were carried out together, which shortened the process. However, the checks of the security steps continue (Yavuz 2020). Vaccines such as the smallpox vaccine produced for many years are given as an example, and it has been stated that the production of new vaccines in a short period creates question marks, and there are doubts that the phase studies of the vaccine have been completed. The fact that mRNA technology is a new technology was also expressed as a reason for hesitation.

Previously, as you know, vaccines were not available like the other day. Which vaccine was it, measles? What was it? It took years, so they issue a vaccine in six months here... (K15-Other professional, 43 years old, 13 years in profession)

One of the participants stated that she was uneasy because of the emergence of new companies other than the companies producing traditional vaccines and COVID-19 vaccines.

...I wonder why companies that produce vaccines can't produce it. The fact that companies that were not previously associated with vaccines came to the market and produced vaccines made me nervous... (K1-Physician, 42 years old, 4 years in profession)

Table 2 Person- and code-based display of participants' reasons for not getting the COVID-19 vaccine

Reasons for not getting vaccination	Number (participants)	Number (codes)
1. Reasons due to COVID-19 vaccine and vaccination	31	95
a. Distrust	27	57
Side effects	20	25
Thinking it wouldn't be effective	10	15
Belief in insufficient data availability	7	11
Feeling like a experimental subject	2	2
Not confident in COVID-19 treatment methods	1	2
Not confident in vaccine content	1	1
Obtaining consent before vaccination	1	1
b. Vaccine production	16	27
Rapid production	10	10
Vaccine is new	2	3
Waiting for a different vaccine supply	7	9
Vaccine supply problem	1	2
Different effects of vaccines on the market	1	1
Vaccine development with new technology	1	1
New pharmaceutical companies to produce vaccines	1	1
c. The effect of the nature of the virus on the vaccine	6	11
The need for continuity of vaccination	3	4
Thinking that a vaccine would not be the definitive solution	2	2
Rapidly mutating virus	1	2
Thinking that vaccines would not prevent infection	1	2
Different clinical course	1	1
2. Individual reasons, group effects	23	74
a. Risk perception	22	32
Thinking of themselves as healthy	8	9
Thinking that they would be protected	6	7
Low perception of risk/benefit	5	5
Thinking that only high-risk groups should be vaccinated	4	6
Never been infected	2	2
Thinking that they would have a mild case and recover	2	2
Low risk in the work department	1	1
b. Having had COVID-19	10	18
c. Knowledge/awareness	13	15
d. Opinions of people around them	3	3
e. Pregnancy	1	4
f. Impact of current disease	2	2
3. Contextual reasons	20	48
a. Distrust	3	5
Distrust of health system	3	5
b. Policies	11	15
Impact of cross-country policies	5	5
No obligation of vaccines	3	3
Obligation practices	2	5
Appointment required	1	1
Attitude of opinion leaders	1	1
c. Infodemic	13	16
Changing information	5	6
Conspiracy theories	4	6
Not understanding how the pandemic happened	4	4

Table 2 (continued)

Reasons for not getting vaccination	Number (participants)	Number (codes)
d. Pharmaceutical company perception	4	6
e. Anti-vaccine currents	2	2
f. Uncertainty	2	2
Rapidly changing policies	1	1
Leaving the choice of vaccine to the individual	1	1
g. Number of cases	1	1
h. Cultural structure	1	1
4. General issues related to vaccination	7	10
a. Medication concerns	3	3
b. Belief in natural immunity	2	2
c. Negative experience	1	1
d. Distrust	1	1
e. Fear of allergies	2	2
f. Interventional process concern	1	1

Some of the participants stated that they would be vaccinated when a domestic COVID-19 vaccine was produced and disseminated. While one participant attributed this to the genetic situation, another participant mentioned that he trusted scientists in Turkey.

...I can say that the Chinese and German vaccines will not affect us. Now, our genetics are not the same as the genetics of the Chinese. Same with the Germans... Everyone did it according to their nation. That's why I didn't find the Chinese and German vaccines suitable for me. When the Turkish vaccine comes out, I will get it... (K16-Other professional, 32 years old, 11 years in profession)

(c) The effect of the nature of the virus on the vaccine

The fact that the protection of COVID-19 vaccines is not lifelong, the need to repeat the vaccination, and the uncertainty experienced in this regard were expressed as reasons for not being vaccinated.

...They call it the third dose right now. Then they'll say maybe a fourth, fifth dose. How far we will be vaccinated is unknown. If it is not known, why are you vaccinating three billion people... (K19-Physician, 26 years old, 2 years in profession)

The fact that there is no guarantee that COVID-19 infection will not be transmitted after COVID-19 vaccination was expressed as a reason for not being vaccinated.

...The solution must be certain. For example, if you are thirsty, you drink water, and your thirst is quenched. That's a sure thing, isn't it? The vaccine will protect

you, so you won't get COVID. This should be said.. (K30-Nurse, 21 years old, 1 year in profession)

It was found that different clinical situations brought about by the peculiarities of COVID-19, such as virus mutation, cause hesitation to be vaccinated.

...The virus is very variable, and there is no such thing as directly killing the person it is caught in. This situation caused me to wait for the Turkish vaccine or to continue to be protected with a mask-distance... (K18-Physician, 30 years old, 4 years in profession)

2. INDIVIDUAL REASONS AND GROUP EFFECTS

In this group, it was observed that the risk perception of COVID-19 was the most important in the vaccination decision. The reasons that affect the low-risk perception are as follows: thinking that they would have a mild case of the disease or that they would overcome the disease, thinking that they were healthy. Two people stated that their decision was due to an illness.

(a) Risk perception

One of the most common issues during the interviews was that being healthy, not having any chronic diseases, and being young had an impact on the COVID-19 vaccination decision. On the other hand, some participants thought that the COVID-19 vaccines should only be administered to risk groups. The situation of not being infected and finding oneself at less risk in terms of transmitting the disease was also expressed.

...I use public transport, I go out in public all the time, but I was not infected. There are also some spoilers that he gives. I haven't been ill for a year,

my second year has come. This does not mean that it will not happen, but it does not coincide either... (K14-Nurse, 22 years old, 1 year in profession)

It was determined that vaccination was not considered necessary because the probability of severe disease was low and its mortality was exaggerated, but the risk/benefit ratio of the vaccine was low due to the low protection of the vaccines.

... the (vaccine's) protection is not complete. I also do not think that COVID-19 has as much mortality as is exaggerated. It is not scarier than tetanus... (K12-Physician, 26 years old, 1.5 years in profession)

Some participants stated that they were already very careful with measures such as masks, paying attention to physical distance and hygiene rules, not entering crowded environments, using N95 masks, and not using public transportation, and stated that they were not vaccinated.

(b) Having had COVID-19

Having had COVID-19 negatively affected the decision to be vaccinated in some people, for reasons such as thinking that the COVID-19 infection has conferred immunity, reducing the fear of the disease due to being mild, and forgetting the severity of the disease even if it was serious because time had passed.

... having COVID-19 greatly influenced my decision to get vaccinated. Because before it, I was terrified. So what happens, do I infect my parents? I didn't know how to get over it myself... but when I got COVID-19 and had a mild illness, I didn't think I needed a vaccine... (K13-Nurse, 22 years old, 1 year in profession)

(c) Knowledge/awareness

Some participants stated that they did not do enough research about the contents of COVID-19 vaccines, that they did not have enough information about this subject, or that they had poor information.

...I have read a few articles like this, but I don't know as much as I can tell about their content at the moment. I only know BioNTech is mRNA. The other is the vaccines we always know. I didn't do much research, so let me tell you... (K13-Nurse, 22 years old, 1 year in profession)

Key people stated that the reason that health personnel are not vaccinated may be a lack of knowledge.

(d) Opinions of people around them

It was found that the personal comments made by people who were reliable in different subjects and who were thought

to be knowledgeable in general, without knowing much about vaccines, affected people.

...My aunt's wife is doing a lot of research. If he is researching so much that a person who translates foreign articles, he certainly does not see vaccination as correct. He says everything is planned. He doesn't lie either, after all, he is a person who researches... (K5-Nurse, 26 years old, 2.5 years in profession)

(e) Pregnancy

Due to the lack of adequate studies on COVID-19 vaccines in pregnant women, one participant tried to overcome the complexity of the benefits and risks of vaccines by choosing to be vaccinated after delivery. In this way, she aimed to ensure that antibodies were passed to her baby through breastfeeding.

3. CONTEXTUAL REASONS

(a) Distrust

Some of the participants also thought that there was no transparency in information sharing during the pandemic period, and therefore there was distrust in the health system.

...How accurate are the numbers, are the diagnoses made correctly, are the deaths caused by this, are those in the intensive care unit unvaccinated? There is no transparency. Maybe he/she would have suffered the same if he/she had not been vaccinated, we do not know about that... (K22-Nurse, 41 years old, 21 years in profession)

(b) Policies

It was determined that the political dynamics between countries, the fact that vaccination was not compulsory, and that equal obligations were not imposed on all groups in society negatively affected the vaccination decision.

...These events first started in China. China should finish last, but they finish first. This seems pretty ridiculous to me. It did not seem very sincere to me that he produced and produced a vaccine again... (K14-Nurse, 22 years old, 1 year in profession)

(c) Infodemic

It was stated that there was a great deal of information pollution about COVID-19 vaccines and infection during the pandemic period. It was observed that people who were confused due to this pollution tended not to be vaccinated. Not being able to understand how the pandemic happened, thinking it was planned, and some conspiracy theories were expressed as reasons for not being vaccinated against COVID-19.

...Some consciously say that elderly patients, those with chronic diseases and that seem like a burden on the society, that harm the state budget, that are not very active in social life, in short, people who are said to be for the society whether it happens or not. It seems to me as if something was done to eliminate that part... (K31-Other professional, 39 years old, 6 years in profession)

It was stated that frequent updating of information on disease and vaccination policies negatively affected the decision.

Okay, science can change as it is added to something, but knowledge cannot be disproved so quickly. So, there is doubt about the necessity of that information... (K13-Nurse, 22 years old, 1 year in profession)

Key people stated reasons such as social media pollution for why health workers were not vaccinated.

...The number-one cause is social media pollution. There is a group on social media that does not want people to be vaccinated, and for some reason shares dirty and false information like crazy in a way we cannot understand ... (A5-Dean, 54 years old, 30 years in profession)

(d) Pharmaceutical company perception

When explaining the reason for not being vaccinated, there were participants who said that the main purpose of COVID-19 vaccines was the commercial concerns of pharmaceutical companies.

...Before the year 2000, global pharmaceutical companies hated vaccines. After the 2000s, they directed their biggest investments towards vaccines. In recent events, for example, whether it is swine flu or bird flu, they have locked us up with fifty million vaccines as a country. It rotted in the warehouses. For this reason, I don't think these vaccines are safe. Countries are in line, they are buying billions of billions. I think it is purely commercial, monetary... (K9-Other Professional, 29 years old, 1 year in profession)

(e) Anti-vaccine currents

An interviewee mentioned that she followed some pages that looked at the event from a sociological point of view, not from a health point of view, and made the following comments.

...I followed a person named SE. I read a few of his articles. It's a little different. He looks at it from a different perspective, not in terms of health.... (K13-Nurse, 28 years old, 3 years in profession)

Another participant stated that she was avoiding being vaccinated or vaccinated en masse because she thought that COVID-19 was produced in a laboratory environment.

...It doesn't make sense to me that the coronavirus was first produced in a laboratory environment and spread to the world, and eventually we all go and get our vaccines every year like robots. Then, as a reaction to them, it was like I didn't get their vaccinations... (K17-Physician, 28 years old, 3 years in profession)

(f) Uncertainty

It was stated that rapid changes in vaccination policies in parallel with new developments during the pandemic period create suspicion in people.

It was stated that leaving the vaccine dose, number, and brand choice to individuals may negatively affect the decisions of individuals to receive COVID-19 vaccines.

...For example, vaccines are still left to the will of everyone, so here are two CoronaVac vaccines, three mRNA vaccines, so these are not things that can be decided by the public. This situation kind of drags the people into a social experiment... (K20-Physician, 30 years old, 4 years in profession)

(g) Number of cases and culture

In the period when the number of COVID-19 cases decreased, one participant stated that she was nearing the end of her pregnancy and she did not have the vaccine because the number of cases decreased.

Key people stated that the structure of society may have an impact on the decision not to be vaccinated.

...Healthcare professionals also have the characteristics of Turkish society... In Turkish society, resistance to treatment exists in every disease. Our patients show resistance to hypertension, diabetes, and cholesterol... (A4-Internal, 64 years old, 41 years in profession)

4. GENERAL ISSUES RELATED TO VACCINE/VACCINATION

Approaches to influenza vaccine and COVID-19 vaccine were found to be similar in some participants. This similarity coincided with the low perception of risk associated with the disease, doubts about the protection of the vaccine, and the need for continuous vaccination.

...I get the flu twice a year...So I'm having a hard time, but I feel so relieved. When I get the flu vaccine, I think I can't get rid of that phlegm or that dirt... (K15-Other professional, 43 years old, 13 years in profession)

(a) Medication concerns

Investigating the content of the drugs, the state of hypersensitivity, and anxiety during the use of all drugs also affected the vaccination status.

...For example, while using a drug, I read the package leaflet, get a second opinion, look at how it has side effects on other people, from the website, on the Internet... (K31-Other professional, 39 years old, 6 years in profession)

(b) Belief in natural immunity

Two people thought that it was more effective to strengthen the immune system with methods such as vitamin supplements, and adequate and balanced nutrition, and that the immunity formed by passing the disease was healthier.

...It is a situation where our immunity should be strong, but we are offered a vaccine at the first stage. There are different conditions, there are many things with vitamin D supplements... (K13-Nurse, 22 years old, 1 year in profession)

(c) Negative experience

An employee mentioned that a negative experience of the rotavirus vaccine she had given to her child in the past had an impact on all vaccine decisions:

For example, I had problems with my child due to vaccinations. When I had his special vaccinations, for example, the rotavirus vaccine, my child had a more severe illness. Because of this, it was like prejudice against vaccination... (P10-Other professional, 40 years old, 6 years in profession)

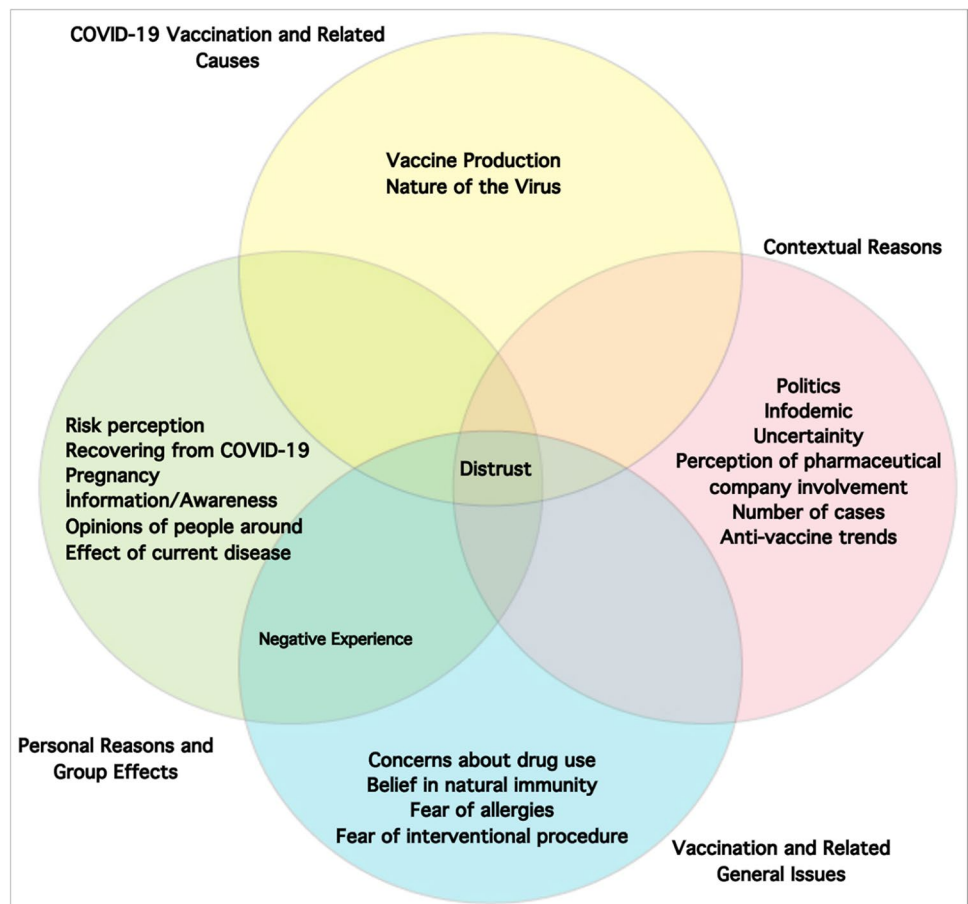
(d) Distrust

It was observed that the existing distrust of drugs affected the COVID-19 vaccine decision.

“...I worked as a journeyman in a pharmacy for at least twelve, thirteen years. Pharmaceutical companies would make great bargains with some dialysis centers, especially if they would make huge donations...so that their drugs could be prescribed. I don't trust the drug either... (P9-Other professional, 29 years old, 1 year in profession)

Distrust of the healthcare system, COVID-19 vaccines, and vaccines, in general, is the intersection of themes, leading to a decision not to be vaccinated for COVID-19. Negative experiences with other vaccines and COVID-19 vaccination are also at the intersection of themes (Fig. 2).

Fig. 2 Thematic summary of reasons for not getting vaccinated against COVID-19



Discussion

In our study, the most common reason for not being vaccinated was a lack of confidence in the vaccine, and healthcare professionals experienced insecurity, especially about the long-term side effects of vaccines. In their study, Kose et al. found that fear of side effects, not trusting the vaccine because it is a new vaccine, thinking that the vaccine would be ineffective, not thinking that the vaccine was necessary, and trusting their immune system were reasons participants cited for not vaccinating against COVID-19 (Kose et al. 2021). In our study, these reasons were common. In a study conducted in Turkey, it was reported that people with a high level of trust in government institutions and healthcare professionals have a significantly more positive attitude towards the COVID-19 vaccine (Karabela et al. 2021). Mandatory COVID-19 vaccination for healthcare professional with ethical arguments such as no harm may increase the rate of vaccination, but this carries the risk of breaking the trust between the healthcare professionals and the institution. Before considering the need for vaccination, it is advocated that policies that will increase trust in the health system should be put into action by addressing the concerns of society (Gur-Arie et al. 2021). Key people stated that it was necessary to act individually in the studies to be carried out and that the desired message should be given using positive discourse in the messages to society.

In a study conducted in Turkey, it was reported that in the case of a vaccine preference, confidence in the domestic vaccine was higher than that in other vaccines (Ogulcan 2021). In this study, some participants reported negative opinions about the Chinese vaccine, and some participants stated that they would be vaccinated only when the domestic vaccine was released. However, it was not emphasized that the people who produced the German vaccine were Turkish. Although some of the participants said they were waiting for the Turkish vaccine, the prejudice against the BioNTech vaccine, whose founders are already Turkish, is a striking result in showing the level of being affected by perceptions rather than facts.

In one study, in the evaluation of the Ministry of Health's decision to "vaccinate health workers first", some participants supported this decision, while others reported that they did not support it because they thought they were being used as guinea pigs (Aci et al. 2022). Similarly, in our study, the idea of feeling themselves as a subject was expressed.

In a study conducted in Turkey, the reasons for not being vaccinated against COVID-19 were reported as the fact that it was a new vaccine and not trusting the companies producing vaccines (Ogulcan 2021). Thinking that vaccine companies have commercial concerns and that trade relations between countries affect this situation, and not trusting the global dynamics imposed by the health industry negatively affects

the decision to be vaccinated. mRNA technology is used in the COVID-19 vaccine production process. As with healthcare professionals, some people in society are skeptical of mRNA vaccines because they describe them as new. However, scientists have been working on mRNA technology for more than 20 years. Some participants incorrectly understood the mRNA vaccine as a live vaccine and expressed their hesitation regarding this method. Among the participants, lack of information about the content and origin of the vaccines and vaccine hesitation overlapped with each other.

It has been reported that people who reject the COVID-19 vaccine have a higher risk perception of the vaccine relative to their disease risk perception, and the fear of harm from the vaccine is dominant (Woodhead et al. 2022). In our study, it was observed that being healthy decreased the risk perceptions of people. Correct management of risk perception is possible with good vaccine communication.

One study found that people with COVID-19 infection had a more positive attitude towards getting vaccinated (Yildiz et al. 2021). In our study, it was determined that having had COVID-19 could affect the vaccination decision both positively and negatively. These different results indicate that many factors are responsible for the development of risk perception. It is known that the attitude against previously recommended vaccines is a common reason for hesitation to be vaccinated. In the study by Biswas et al., it was reported that a history of flu vaccination increased the probability of receiving the COVID-19 vaccine (Biswas et al. 2021). It is noteworthy that none of the participants in our study also received the flu vaccine.

Fast-spreading misinformation exacerbates the problem, fueling fear and speculation (Karabela et al. 2021). In our study, it was determined that this information pollution confuses people. Although governments have the power to correct inaccurate and distorted health information spread on the Internet, these remain limited (Wu and McCormick 2018). For this reason, health professionals have an important role in correcting misinformation and communicating evidence-based health information to the public. Another important point in overcoming and managing the infodemic is to bring "risk communication, community participation, media literacy" to society and especially to healthcare professionals.

A UK study reported that the spread of misinformation causes vaccine hesitation (Lockyer et al. 2021). In a study on Google searches, it was determined that anti-vaccine searches increased during the pandemic (Pullan and Dey 2021). In our study, the idea that the pandemic was planned was expressed by people who took into account the anti-vaccine thoughts on the Internet as a source of information. It is critical to plan initiatives that can increase the health literacy levels of societies in the fight against the information epidemic (Karabela et al. 2021). To combat misinformation,

some social media platforms have collaborated with health authorities. Some measures have been taken, such as redirecting to an automatic information page when something related to COVID-19 is shared on Instagram (Bozkurt 2021). It is recommended that public health experts increase their YouTube content. In addition, vaccination opponents should be answered with informational messages consisting of real-life stories of vaccinated people, just like their methods (Yiannakoulis et al. 2019). It has been shown that the statements of the Ministry of Health and the sharing of images of vaccinated health workers on social media have a positive effect on people's opinions about the COVID-19 vaccine (Aci et al. 2022).

For the formation of a positive perception towards the vaccine in societies, the recommendations of the experts working in the health sector are important and can have a motivating quality for the masses. Experts' knowledge of the perceived likelihood, perceived seriousness, perceived effectiveness, and perceived potential harms of the vaccine can drive mass perceptions (Reiter et al. 2020).

During the period of the study, the COVID-19 vaccination program was ongoing, and the interviewees were people who had not yet received their first vaccination. Restrictions on access to those who are not vaccinated for COVID-19 were discussed at the time that the polymerase chain reaction (PCR) test requirement was just beginning (Ministry of Interior Republic of Turkey 2021). It is thought that at least some of the participants may have been vaccinated in the period after our study was conducted. The study reflects the types of hesitation specific to the period in which the data were collected, rather than general hesitation. The median age of the participants in the study was 29 years, and the median period of working in the profession was 4 years. There were two people with chronic diseases. Due to this distribution, there is a possibility that the representation of the elderly and people with chronic diseases may not be sufficient.

Conclusion

Insecurity in COVID-19 vaccines, infodemic, uncertainty about vaccines/vaccination, political approaches, lack of knowledge/awareness, and risk perception form a tangle of concepts. As knowledge and awareness about the disease increase, there is an increase in risk perception. This increases the vaccination rates. It is necessary to prevent a decrease in the uptake of vaccination, which is the most effective method in the fight against the pandemic, due to this hesitation.

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Data availability The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Code availability The codes used throughout the study are available from the corresponding author upon reasonable request.

Declarations

Ethics disclosure All procedures were performed according to the ethical standards of the Declaration of Helsinki and the National Research Committee. This study was approved by the Clinical Research Ethics Committee of Istanbul University, Faculty of Medicine (approval number 2021/938; date: 07/06/2021). Written informed consent was obtained from all participants or their legal representatives, given the prospective nature of this study.

Consent to participate Written informed consent was obtained from all participants or their legal representatives.

Consent for publication The written informed consent data are available from the corresponding author on reasonable request.

Conflict of interest The authors declare no conflict of interest regarding this article.

References

- Aci OS, Kackin O, Karaaslan S et al (2022) Qualitative Examination of the Attitudes of Healthcare Workers in Turkey Regarding COVID-19. *Vaccines Int J Nurs Knowl* 33(2):136–146. <https://doi.org/10.1111/2047-3095.12342>
- Baltaci A (2019) The Qualitative Research Process: How to Conduct a Qualitative Research? *Journal of Ahi Evran University Institute of Soc Sci* 5(2):368–388. <https://doi.org/10.31592/aeusbed.598299>
- Biswas N, Mustapha T, Khubchandani J et al (2021) The Nature and Extent of COVID-19 Vaccination Hesitancy in Healthcare Workers. *J Community Health* 46(6):1244–1251. <https://doi.org/10.1007/s10900-021-00984-3>
- Bozkurt F (2021) A Return of Fake and Hoaxed News in the COVID-19 Pandemia Process: Examination of Infodemic in the Context of Turkey *International Journal of Folk Stud* 4(7):135–151
- Cetintepe SP, İlhan MN (2020) Risk Reduction in Healthcare Workers in the COVID-19. *Pandemic J Biotechnol and Strategic Health Res* 4:50–54. <https://doi.org/10.34084/bshr.712539>

- Department of Labor Occupational Safety and Health Administration (2022) Hazard Recognition. <https://www.osha.gov/SLTC/covid-19/hazardrecognition.html>. Accessed 16.12.22
- Gur-Arie R, Jamrozik E, Kingori P (2021) No Jab, No Job? Ethical Issues in Mandatory COVID-19 Vaccination of Healthcare Personnel. *BMJ Glob Health* 6(2):e004877. <https://doi.org/10.1136/bmjgh-2020-004877>
- Karabela SN, Coskun F, Hosgor H (2021) Investigation of the Relationships between Perceived Causes of COVID-19, Attitudes towards Vaccine and Level of Trust in Information Sources from the perspective of Infodemic: The Case of Turkey. *BMC Public Health* 21(1):1195. <https://doi.org/10.1186/s12889-021-11262-1>
- Kose S, Mandiracioglu A, Sahin S et al (2021) Vaccine Hesitancy of the COVID-19 by Health Care Personnel. *Int J Clin Pract* 75(5):e13917. <https://doi.org/10.1111/ijcp.13917>
- Lockyer B, Islam S, Rahman A et al (2021) Understanding COVID-19 Misinformation and Vaccine Hesitancy in Context: Findings from a Qualitative Study Involving Citizens in Bradford. *UK Health Expect* 24(4):1158–1167. <https://doi.org/10.1111/hex.13240>
- Ministry of Interior Republic of Turkey (2021) PCR Test Obligation Circular Sent for Some Activities. <https://www.icisleri.gov.tr/bazi-faaliyetler-icin-pcr-testi-zorunlulugu-genelgesi-gonderildi>. Accessed 16.12.22
- Ogulcan M (2021) People's View of COVID-19 Vaccine in Turkey. *Dicle Med J* 48(3):583–594. <https://doi.org/10.5798/dicletip>
- Pullan S, Dey M (2021) Vaccine Hesitancy and Anti-vaccination in the Time of COVID-19: A Google Trends Analysis. *Vaccine* 39(14):1877–1881. <https://doi.org/10.1016/j.vaccine.2021.03.019>
- Reiter PL, Pennell ML, Katz ML (2020) Acceptability of a COVID-19 Vaccine among Adults in the United States: How Many People would Get Vaccinated? *Vaccine* 38(42):6500–6507. <https://doi.org/10.1016/j.vaccine.2020.08.043>
- To KW, Lai A, Lee KC et al (2016) Increasing the Coverage of Influenza Vaccination in Healthcare Workers: Review of Challenges and Solutions. *J Hosp Infect* 94(2):133–142. <https://doi.org/10.1016/j.jhin.2016.07.003>
- Woodhead C, Onwumere J, Rhead R et al (2022) Race, Ethnicity and COVID-19 Vaccination: a Qualitative Study of UK Healthcare Staff. *Ethn Health* 27(7):1555–1574. <https://doi.org/10.1080/13557858.2021.1936464>
- World Health Organization (2014) Report of the SAGE Working Group on Vaccine Hesitancy. <https://www.asset-scienceinsociety.eu/pages/report-sage-working-group-vaccine-hesitancy>. Accessed 16.12.2022
- Wu JT, McCormick JB (2018) Why Health Professionals Should Speak Out Against False Beliefs on the Internet. *AMA J Ethics* 20(11):E1052–E1058. <https://doi.org/10.1001/amajethics.2018.1052>
- Yavuz E (2020) COVID-19 Vaccines Turkish. *J Fam Pract* 24(4):223–234. <https://doi.org/10.15511/tahd.20.00427>
- Yiannakoulis N, Slavik CE, Chase M (2019) Expressions of Pro- and Anti-vaccine Sentiment on YouTube. *Vaccine* 37(15):2057–2064. <https://doi.org/10.1016/j.vaccine.2019.03.001>
- Yildiz Z, Gencer E, Gezezen NF (2021) Evaluation of Individuals' Attitudes towards Vaccines Developed in the COVID-19. *Pandemic Process J Gumushane Univ Social Sci Institute* 12(3):877–889
- Zhang Y, Zeng G, Pan H et al (2021) Safety, Tolerability, and Immunogenicity of an Inactivated SARS-CoV-2 Vaccine in Healthy Adults Aged 18–59 Years: a Randomised, Double-blind, Placebo-controlled, Phase 1/2 Clinical Trial. *Lancet Infect Dis* 21(2):181–192. [https://doi.org/10.1016/s1473-3099\(20\)30843-4](https://doi.org/10.1016/s1473-3099(20)30843-4)

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