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The COVID-19 Vaccine Opinions of Women Planning a Pregnancy: International Web Blogs Scanning

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ABSTRACT

Background: The unprecedented COVID-19 has infected millions of people and killed hundreds of thousands of people. A strategy to contain the spread of the disease was the development of the COVID-19 vaccine. **Objective:** In our study, it was determined the opinions of women who are planning to become pregnant about the COVID-19 vaccine. **Methods:** Blogs were used as the data source in the research, which was designed as a descriptive qualitative study. For this purpose, the expressions of 34 women identified between February and March 2021 were evaluated with directed qualitative content analysis. **Results:** Psychological changes, cognitive changes, and coping methods were determined as the themes of our results. This study demonstrates the value of using qualitative methods to determine the thoughts of women planning to become pregnant regarding the COVID-19 vaccine. **Conclusion:** For women planning pregnancy, continued research into vaccine safety and efficacy is vital, and results should be carefully investigated and handed in the right channels.

Keywords: Blogs, COVID-19, Pregnancy, Pregnancy planning, Vaccine.

1. BACKGROUND

The novel Coronavirus infection (COVID-19), also called SARS-CoV-2, has spread rapidly as an urgent global public health problem after it was first seen in Wuhan, Hubei Province of China in December 2019. It has been recognized as a pandemic since the beginning of 2020 by the World Health Organization (WHO) (1).

Many measures have been taken around the world to prevent the spread of infection and to ensure that the health system works adequately and effectively. The pregnancy process has brought many questions about both maternal and infant health during the pandemic period. While it is stated by some health centers that pregnancies planned with spontaneous or assisted reproductive techniques can continue as in the normal process, some centers have decided to postpone it for a while. In this process, vaccine studies have also started and started to be implemented as of January 14, 2021. Since it is thought to be affected by the coronavirus pandemic, some recommendations have been published by national and international authorities to protect maternal and infant health regarding pregnancy planning. Available data indicate that pregnant women are at greater risk of contracting COVID-19 than non-pregnant women (2-6).

The Centers for Disease Control and Prevention (CDC) has included pregnancy as a risk factor for severe COVID-19 (7). The Joint Committee on Vaccination and Immunization (JCVI) recommends that pregnant women should not be vaccinated as a precautionary measure, and those who plan to become pregnant should not plan pregnancy within 3 months after the first dose of the vaccine, since dead vaccines do not harm the mother and baby during pregnancy. They recommend getting pregnant after vaccine doses are completed (8). The Advisory Committee on Immunization Practices (ACIP) strongly recommends vaccination for individuals who are in the priority group and who are not pregnant. Additionally, the American College of Obstetricians and Gynecologists (ACOG) recommends vaccinating individuals who are actively trying to conceive or are considering pregnancy and who meet the ACIP vaccination criteria in priority groups (9). Additionally, it states that it is not necessary to delay pregnancy after completing both doses of the COVID-19 vaccine.

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Considering the mechanism of action and safety profile of the vaccine in non-pregnant individuals, they state that COVID-19 mRNA vaccines will not increase the risk of infertility. If a person becomes pregnant after the first dose of the COVID-19 vaccine, the second dose should be administered as directed, and participation in the CDC's V-SAFE program is encouraged if the person becomes pregnant within 30 days of completing the vaccine doses (9). This program is a smartphone-based post-vaccination health checker for people who have had the COVID-19 vaccine. The V-SAFE uses the text message and web surveys of the CDC to check whether individuals develop health problems after COVID-19 vaccination. Information on pregnancy status is also collected during and after vaccination. The system provides telephone follow-up to anyone who reports a pregnancy or medically significant complications during pregnancy (7).

Despite the opinions of health authorities regarding the COVID-19 vaccine and pregnancy plan, individuals seem to be indecisive on this issue. In a study by Sallam et al. in Arab countries, individuals' hesitations about the COVID-19 vaccine were examined. When the vaccination status is examined in terms of gender, it is seen that women are statistically significantly more anti-vaccine than men. When asked about the reason for those who did not want to be vaccinated, 23.4% said that they thought the vaccine caused infertility. When the most frequently used information sources were compared to health workers/platforms and social media, it was determined that the use of social media was significantly higher (10). In the study by Salali and Uysal in Turkey, it was found that men are more likely to be vaccinated than women (11). Similar results were found in the study of Köse (12). In the study of Geoghegan et al. (2021), in which they examined the attitudes of pregnant women toward the COVID-19 vaccine, it was concluded that women hesitated to get vaccinated because of the thought that the vaccine could harm their unborn babies (13). Although there is no evidence in the literature regarding the effects of COVID-19 infection and vaccine on female and male fertility, it is seen that especially women are hesitant to be vaccinated because of the concerns that their fertility will be adversely affected and their unborn babies will be harmed during pregnancy. However, it should not be forgotten that especially pregnant women have a more severe COVID-19 infection if they are not vaccinated. Therefore, it is critical to examine the thoughts of women who are planning to become pregnant about vaccination. It is thought that this study will contribute to the literature in terms of determining the thoughts of women who are planning to become pregnant about the COVID-19 vaccine. Considering the possibility of not being vaccinated and having COVID-19 infection, it is important to learn the perspective of women to provide adequate counseling about vaccination to health professionals who provide preconception care and work in the field of assisted reproductive techniques.

2. OBJECTIVE

Therefore, in our study, it was determined the thoughts of women who are planning to become pregnant about the COVID-19 vaccine.

3. MATERIAL AND METHODS

Sample and study design

A descriptive qualitative study was designed using blogs as the data source. The search was conducted using the online search engine Google between February and March 2021. Combinations of different terms such as "COVID 19 vaccine and infertility", "covid 19 vaccine and pregnancy", "covid 19 vaccine and conception" were used in the search. After four independent and different scans by researchers at different times, purposeful blogs were found. In total, six international blogs were scanned. Three blogs from the scanned blogs were excluded from the analysis because they excluded the thoughts of women who are planning to become pregnant about the COVID-19 vaccine. A total of 34 women's statements were evaluated from the blogs found suitable for the purpose. The selected blogs are online areas that anyone can enter. Blogs contain all keywords. Women can create a topic or comment under an existing topic by entering these blogs. Comments made are shown in forums using nicknames that women create for themselves. In qualitative research, a sampling approach is used to determine the sample size, which requires continuing to collect data until the stage (saturation point) when the concepts and processes that may be the answer to the research question begin to repeat. When the emerging concepts and processes start to repeat each other, it is decided that they have reached sufficient data sources (14, 15). This research was also terminated when the number of samples reached 34 and no new information emerged.

Data analysis

The data were analyzed with the inductive method using the content analysis method. The comments taken from the blogs were read separately by four researchers, and the sections expressing feelings, thoughts and experiences were underlined and codes were created. Comments from blogs were carefully read several times to get a general idea of the information and to ensure the accuracy of the data analysis. While evaluating the data, we paid attention to the fact that our beliefs and values do not affect the interpretation of the data. During the thematic analysis, four researchers independently read all transcripts and identified the codes. After this evaluation, codes and sub-themes were combined to form themes. The researchers performed the analysis steps independently. Then, they met, discussed the codes, and agreed on the thematic statement that best described the findings. In reporting the data; plausibility, compatibility with experience, credibility, importance and legibility features was provided (14).

Ethical Consideration

Informed consent was not required as the women in the study did not need to register to participate in these public forums. These forums are online and openly ac-

Themes	Sub-Themes	Codes
Psychological Changes	Emotions	- Fear -Anxiety -Uncertainty
	Opinions	-Thinking that being vaccinated are less dangerous than virus transmission -Thinking that vaccinating will cause more health problems -Thinking that the vaccine causes fertility problems -Thinking that it has long-term side effects on the fetus were determined
Cognitive changes	Attitudes	-Confidence/distrust in the safety and efficacy of the vaccine, (Thinking that it is unsafe during pregnancy and breastfeeding), -Trust/distrust of scientists and health professionals, - Preferring to wait when there is no clear information, - Believing that pregnancy will be healthier after vaccination -Pregnancy planning after vaccination
	Knowledge	- Recommending not to get pregnant after vaccination -Not knowing the protection of the vaccine -Not knowing enough about the safety of the vaccine -Believing that there are not enough scientific sources -Not knowing the effects on fertility in men
Coping methods	Problem-focused coping	- Trying to communicate with people who have been vaccinated or will be vaccinated -Seeking scientific information about vaccines

Table 1. Themes, subthemes and codes about opinions of women planning pregnancy about COVID-19 vaccine

cessible forums. Shared comments are deemed tacit consent as they are public. Numbering was used to ensure the confidentiality of the expressions of the women who were included in the research and who used nicknames in their blog comments. No personal information was provided about the participants.

4. RESULTS

The comments of 34 women who were planning pregnancy were included in the study. Because of the content analysis conducted to determine the thoughts of women planning pregnancy about the COVID-19 vaccine, 3 themes, 5 sub-themes and 18 codes were determined (Table 1).

Theme 1. Psychological Changes

The decision to have the COVID-19 vaccine or not causes psychological changes in women who are planning a pregnancy. There is a sub-theme of emotions under the theme of psychological changes.

Sub-Theme: *Emotions*: In this sub-theme; there are codes of fear, anxiety and uncertainty. “I am anxious... if we start trying pregnancy from this month, even if pregnancy occurs in 2–3 months, the antibodies of the vaccine may not protect me until birth...” (24). “I am trying to get pregnant with treatment, I am afraid of risking my pregnancy by getting corona vaccine...” (21). “My 2 attempts were unsuccessful, everything is going well now. Transfer will be made, if pregnancy occurs, I am worried about risking this precious pregnancy with the vaccine, which I am not sure about the side effects...”(33)

Theme 2. Cognitive changes

The COVID-19 vaccine has also caused some cognitive changes in women planning pregnancy. Under this

theme, there are sub-themes of opinions, attitudes and knowledge.

Sub-Theme: *Opinions*: In the comments expressed by the women; the codes of thinking that being vaccinated are less dangerous than virus transmission, thinking that vaccinating will cause more health problems, thinking that the vaccine causes fertility problems and thinking that it has long-term side effects on the fetus were determined.

“The 18 women who participated in one study became pregnant after vaccination. The number was not that high, but if 18 women could get pregnant, it means that the vaccine does not prevent pregnancy. However, everyone should do what they feel comfortable with. The long-term health problems of Covid seem to be much worse and higher than the fertility problems after vaccination, so it makes sense for me to get vaccinated. . . but again, it’s your and your doctor’s decision. Whatever you feel comfortable with is best for you!” (7)

“I think the vaccine has a long-term side effect on the baby” (27). “We are already trying to get pregnant with treatment, and I came across different information on the internet. I m very confused.” (21)

Sub-Theme: *Attitudes*: Under this sub-theme; codes of confidence/distrust in the safety and efficacy of the vaccine, (Thinking that it is unsafe during pregnancy and breastfeeding), trust/distrust of scientists and health professionals, preferring to wait when there is no clear information, and believing that pregnancy will be healthier after vaccination-pregnancy planning after vaccination was included.

“I saw on the news this morning that the coronavirus vaccine may be offered to pregnant and nursing mothers if the benefits outweigh the risks. I am currently breastfe-

eding my child and planning a re-pregnancy in the near future. Personally, I will receive the vaccine while I am breastfeeding or pregnant.” (15).

“My husband is an emergency room doctor. He had received the first dose of his vaccine the day before. He felt there was no need to wait because it was an inactivated vaccine, but to be sure, we consulted a colleague in obstetrics and gynecology, and he said there was no need to wait.” (23).

“Girls, I talked to some gynecologists. They said the Covid vaccine is an inactive vaccine that poses no risk and does not affect sperm. I am writing this for the information of anyone like me who is obsessed with this issue” (19).

“I think inactivated vaccines are not a problem for pregnancy, but there is a 2-month waiting period for the active vaccine. For example, there are many people who contracted the corona and got pregnant and had no problems with their baby. I think that inactivated vaccine does not cause problems in this way, we will not have to wait in vain”(19). “I plan to get vaccinated as soon as I give birth, but when I am pregnant, I can't get vaccinated.” (12).

“Wow, interesting, health professionals recommend that high fever can be harmful to the fetus, so you don't raise your body temperature. They say you should wait until the 2nd trimester to enter places such as sauna, jacuzzi, in case it causes a high fever. Just a thought, doesn't you think it's confusing when healthcare professionals say so, recommending the Covid vaccine during pregnancy? The vaccine can also cause a high fever, after all! It is difficult to know what the correct answer is”(15).

“I cannot trust the vaccine nowadays, I will try to get pregnant and get vaccinated in the future.”(25)

Sub-Theme: Knowledge: Consistent with the statements of the women in our study, the codes for recommending not to get pregnant after vaccination, not knowing the protection of the vaccine, not knowing enough about the safety of the vaccine, believing that there are not enough scientific sources, and not knowing the effects on fertility in men were identified under the knowledge subtopics.

“I wonder if there is a difference between men and women when it comes to vaccinations, i.e., does a woman's vaccination have the same effect on the baby as a man's? I could not find any information about this on the internet” (22).

“I want to get an opinion on a topic I am in a dilemma about. I want to try to get pregnant, but my husband will get COVID-19 vaccine this month. What effect does the vaccine have on men? Do you know? It will be my turn in late April or early May. Do you think it's reasonable to postpone pregnancy until after vaccination, or not think about pregnancy at all without mixing the vaccine? There are not enough scientific means” (24). “And men? Even if we are not vaccinated, we will be our wives. Should he wait two months too? After all, the baby is growing in our body, but the reason for the loss of many babies is unsuitable sperm!” (29)

“From what I have read, participants in the COVID -19 vaccine trial were told to freeze their sperm if they

wanted to have children in the future, the effect of the vaccine on fertility is unclear. . . . That to me is a warning sign, an indication that there are not enough studies on the effects on fertility.”(5)

Theme 3. Coping methods

Women planning pregnancy cope with the stress they feel for the COVID-19 vaccine using similar methods. Under this theme, there is a sub-theme of problem-focused coping. **Sub-Theme: Problem-focused coping:** This subtopic includes trying to communicate with people who have been vaccinated or will be vaccinated and seeking scientific information about vaccines.

“I have read numerous articles stating that the vaccine is probably safe and will not have any negative effects on pregnancy. “ (11). “Is someone planning to get pregnant soon and has become vaccinated or will get vaccinated? There are not many studies on pregnancy after vaccination, so I want to hear more ideas.” (1).

5. DISCUSSION

This section discusses the research findings in three parts: psychological changes, cognitive changes, and categories of coping methods.

Psychological changes

We observed that the women in our study who were planning to become pregnant experienced ambivalent emotions while deciding whether or not to vaccinate COVID -19. The emotions they commonly felt included fear, anxiety, and uncertainty. Due to the accelerated approval process for the vaccine, the potential harmfulness of the vaccine to recipients is one of the most commonly cited fears and concerns in the literature (16). Many women have expressed fears of the unknown effects of a new vaccine. Women focus on the risks of the vaccine (to themselves and their unborn child) rather than the disease. Similar results were found in the study by Ceulemans et al. (2021) (17). Women who plan to become pregnant and are pregnant express that they are afraid of the risks associated with the vaccine COVID -19 (to themselves and their unborn child), that they do not want to be guinea pigs, and that they view the risks associated with the vaccine more strongly than COVID -19 itself (17). Numerous studies show that pregnant women have greater fears and anxieties about getting vaccinated against COVID -19 than non-pregnant women. This is because the vaccine could be harmful to the fetus, and they stated that they want to see more evidence of the safety and effectiveness of the vaccine (17-20). Women who plan to become pregnant using spontaneous or assisted reproductive techniques, and whom we included in our study sample, maybe fearful and concerned about the potential harms of the vaccine COVID -19 to the fetus, just as pregnant women are. In our study, we see that this anxiety is quite prevalent among women who are planning to undergo treatment with assisted reproductive techniques. In a study by Lin et al. (2007) in Taiwan with 15 women who became mothers using ART, the women reported that they most feared the “health and safety of the fetus” during pregnancy (21). Biolog-

ically, pregnancies that occur after infertility treatment are the same as naturally occurring pregnancies (22). However, these pregnancies that occur after the multi-dimensional crisis caused by infertility represent a paradoxical life event in which women experience important biological and psychosocial changes (23). Most of these couples turn to ART to have a child. Pregnancies after ART are extremely valuable, expensive, and risky for couples. The couples invest not only their money but also their energy, time, and hope in medical treatment for this pregnancy (24). However, it is important that health professionals inform women who are planning to become pregnant that pregnant women are at increased risk for serious illness during pregnancy, with increased risk of admission to the intensive care unit, increased need for mechanical ventilation, and possibly increased risk of death (25). In newly published studies, available data on SARS-CoV-2 vaccines during pregnancy indicate that they are safe and effective (26, 27).

In addition, SARS-CoV-2 antibodies have been detected in cord blood and breast milk after vaccination during pregnancy, suggesting that maternal vaccination provides some protection for the infant (27). In particular, delaying vaccination during fertility treatment could result in an unknown delay, as fertility and IVF treatments are often not successful on the first attempt and may require numerous attempts to achieve a lasting pregnancy (28). Given the uncertainty of treatment success, it is therefore reasonable to recommend vaccination as soon as the eligibility criteria are met, "at the earliest possible time, whether before conception or during pregnancy," as advocated by the ASRM (29).

Also, the fact that the women in our study stated that they were uncertain about the effects of the vaccine COVID -19 on themselves and their baby if she became pregnant and that there were not enough studies are similar to the results of the studies by Gerussi et al. (2021) and Skjefte friends (2021) (18, 30, 31). At the beginning of vaccination programs, there was little evidence to support vaccination decisions, and recommendations for vaccination in pregnancy varied over time and by country (COMIT, 2021). Because pregnant women were excluded from the initial COVID -19 vaccine trials, we believe that there are currently limited data on the safety and efficacy of vaccines in pregnancy.

Therefore, we believe that women's fear, anxiety, and uncertainty about a vaccine whose effect on themselves and the fetus is still uncertain are due to the potential pregnancy losses they may experience. The first randomized clinical trial to evaluate the safety, tolerability, and immunogenicity of a COVID -19 mRNA vaccine in pregnant women began in February 2021 and is scheduled to end in June 2022 (32). After completion of our study, Shimabukuro et al published safety data from a voluntary registry of postvaccination follow-up. No obvious safety signals were highlighted. The incidence of adverse pregnancy and neonatal outcomes (i.e., fetal loss, preterm birth, small size relative to gestational age, congenital anomalies, and neonatal death) in vaccinated pregnant women was comparable to that reported

in pregnant populations studied before the pandemic COVID -19. In addition, in the studies by Gray et al. and Rottenstreich et al. it was shown that administration of the COVID -19 mRNA vaccine during pregnancy results in a good immune response with significant antibody levels similar to those seen in nonpregnant women (32-34). Pregnant women do not appear to be more susceptible to SARS-CoV-2 infection than nonpregnant women, but they are at higher risk for severe COVID -19 disease (35). Compared with nonpregnant women of reproductive age, pregnant women with SARS-CoV-2 infection are more likely to be admitted to the intensive care unit, receive invasive ventilation and extracorporeal membrane oxygenation, and die. COVID -19 in pregnancy is associated with an increased risk of pregnancy-specific complications of preeclampsia, preterm birth, and stillbirth (25, 35). Therefore, it is important that healthcare professionals assist women who are planning to become pregnant to accept the Covid 19 vaccine.

Cognitive changes

From the women's statements analyzed, it appears that the decision to vaccinate or not to vaccinate COVID -19 also causes some cognitive changes in women who are planning to become pregnant. In the statements of some women, they consider vaccination less dangerous than infection with the virus. In the study by Craig et al. (2020), some women participating in the study state that they consider vaccination during pregnancy to be safer than the risks of contracting the disease (36). This finding confirms that risk perception related to COVID -19 is crucial for vaccination behavior (37). Specifically, as risk perception and fear of contracting COVID -19 increases, so does the intention to consider the COVID -19 vaccine more confidently (37-39). The rapid increase in the number of cases during the COVID -19 pandemic may have brought healthcare systems to the brink of collapse, and the loss of life reflected in the media may have heightened negative emotions. People who view COVID -19 as a serious disease are more positive about vaccination against COVID -19 (40). From the statements of another part of the women in our study, they believe that the vaccine causes fertility problems and has long-term side effects on the fetus. In the study by Chevallier et al. (41), the effect of the vaccine candidates on future fertility, in particular, was frequently raised by patients, as there are no long-term data to evaluate this outcome.

Additionally, Google shows that internet searches related to the vaccine COVID -19 and fertility increased significantly in the 48 days following emergency approval (EUA). The five most popular search terms were "COVID Vaccine Fertility," "COVID Vaccine and Infertility," "COVID Vaccine Infertility," "COVID Vaccine Fertility CDC," and "COVID-19 Vaccine Infertility" (42). Both the women in our study and the studies in the literature suggest that the vaccine causes fertility problems. We believe this is due to women not having access to correct information. It is important to remove barriers to access and improve the scientific evidence for the safety and efficacy of the COVID -19 vaccines. Providing accurate and timely information to healthcare

providers and women planning pregnancy can increase confidence in COVID -19 vaccines in this population.

Most women in our study showed in the safety and efficacy of the vaccine, preferring to wait when there is no clear evidence to support the vaccine and believing that planning a pregnancy after vaccination is less risky. In their study, Jaffe et al. (43) identified three main issues that drive women's decisions about participating in vaccine trials during pregnancy: Evidence, Risk, and Trust (43). In our study, women's attitudes toward vaccination were found to be similar to these themes. These results suggest that for women planning to become pregnant, the safety of their unborn child is the most important factor in deciding whether to be vaccinated with the COVID -19 vaccine.

Additionally, although some women indicated that they trusted scientists and health professionals regarding the vaccine COVID -19, the some of them indicated that they did not trust scientists and health professionals. In the study by Jaffe et al., there is information that pregnant women initially approached health professionals for information about the vaccine COVID -19 but they could not get clear answers. Here, the women indicated that they felt distrust toward the health workers, similar to our study. Discussion of different and even opposing views among scientists on television and social media outside the scientific platform causes different opinions in the society in the COVID-19 pandemic.

Additionally, women feel that scientific resources are inadequate. As we found in our research, limited knowledge about vaccines decreases confidence in the vaccine COVID -19 and increases the desire for information (44). As misinformation and negative news in social media and news about vaccine safety create distrust and negative attitude toward vaccines (45, 46), in this case, it is important to provide accurate information from the right sources to reduce hesitation toward vaccines. Increasing vaccination rates among women planning to become pregnant is extremely important, and this can be achieved by changing perceptions and beliefs. Although COVID -19 vaccines are beginning to be considered safe during pregnancy in studies published after the completion of our (COMIT,2021), health professionals should be aware of the conflicting messages and continued hesitancy of women planning pregnancy. They should have meaningful, supportive, and accurate conversations with their patients about the COVID -19 vaccine decision.

In examining the testimonies of women whose spouses are to be vaccinated against coronavirus, it was found that they were concerned about the effects of the vaccine on male fertility and sought information. In the study by Kumar and Kaur (47), there is some concern about the possible effects of the vaccine on male fertility in those COVID -19 vaccinated (47). Admittedly, data on COVID -19 mRNA vaccines are incomplete compared with conventional vaccines based on long-term studies with large samples. However, accumulating evidence suggests that serious adverse events caused by mRNA vaccines are very rare and women or men do not experience fertility problems after vaccination (48). Therefore,

any adult planning to get pregnant should consult an expert about the effects of the vaccine on fertility and get the right information.

Coping methods

Women planning pregnancy cope with the stress they experience regarding the vaccine COVID -19 in problem-oriented ways. Women try to communicate with those who have been vaccinated or will be vaccinated and seek scientific information about vaccination. COVID -19 Vaccine hesitancy among those who are pregnant or planning to become pregnant is, unfortunately, increasing due to misinformation from false reports linking vaccination to pregnancy loss (49). This situation causes women to stress about the vaccine and raises concerns that the vaccine may affect conception and pregnancy (50). Problem-focused coping eliminates the life-threatening event, reduces its impact, and attempts to change the stressful person-environment relationship causing the stress and seek resources for resolution (51). In our study, women planning pregnancy try getting the right information and look for resources.

6. CONCLUSION

It appears that for women planning to become pregnant, the safety of the unborn child is the most important factor in deciding whether to receive the vaccine COVID -19. It has been noted that women planning a pregnancy, either spontaneously or through artificial insemination, are concerned about the potential harm of the COVID -19 vaccine to the fetus and fear that the vaccine may cause fertility problems. These negative feelings have been found to be most prevalent among women who plan to become pregnant using artificial insemination.

For those planning in vitro fertilization or spontaneous pregnancy, it is in their best interest to consider the appropriateness of vaccination before pregnancy or early pregnancy and to be vaccinated as soon as possible, as the risk of severe disease and associated morbidity and mortality associated with COVID may be longer. It is of great importance that health professionals inform and support women on this issue. Women who recognized COVID -19 as a serious disease had more positive attitudes toward vaccination COVID-19. This tells us that women planning pregnancy must be convinced that the risk posed by the virus is greater than the risk of receiving a new vaccine to participate in the COVID -19 vaccine trial.

Generally, it can be seen that women planning a pregnancy are seeking information about the effects and side effects of the vaccine COVID -19 during pregnancy from health professionals, the media, and online platforms. Develop appropriate information, education, and communication channels to raise spread awareness about the vaccine availability of vaccines, procedure and benefits, both through health professionals and through mainstream and social media, to create a positive attitude toward vaccines can contribute to women's positive attitudes toward vaccines.

Nurses and other health professionals should recognize the psychological and cognitive problems of women planning pregnancy Covid 19 vaccine, assess coping methods, and provide psychosocial support. Along these lines, training and counseling with evidence-based practices can be provided via online tools for the Covid 19 vaccine. Systems can be created to allow women planning pregnancy to actively communicate with other women going through the process. Telecounseling can be done with a holistic approach that is responsive to women and tailored to the individual.

- **Availability of data and material:** The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.
- **Consent to participate:** According to the passive analysis, there was no need for informed consent because no registration was required for women to participate in these public forums. These forums were online and openly accessible. Because shared comments are open to the public, it was accepted as the implied consent.
- **Author's contribution:** Concept – E.A.; Design – I.S, M.A.T., E.A., S.O.; Supervision – M.A.T.; Data Collection and/or Processing – I.S, E.A., S.F; Analysis and/or Interpretation – I.S, M.A.T., E.A., S.O.; Literature Review – E.A., S.F ; Writing – M.A.T., E.A., S.O.; Critical Review –I.S, M.A.T., E.A., S.O.
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