

Sexual and reproductive health needs and concerns of Iranian HIV-positive pregnant women during the COVID-19 pandemic

Firoozeh Firoozehchian^{1,2}, Zahra Behboodi-Moghadam², Leila Shahmohammadi³, Leila Asadi²

¹Department of Midwifery, Zeynab (P.B.U.H.) School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran

²Department of Midwifery and Reproductive Health, Faculty of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran

³Behavioral Disease Counselling Center of Imam Khomeini Hospital, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Introduction: The COVID-19 pandemic has affected health and well-being of people throughout the world. Considering the complicated physical and mental problems of human immunodeficiency virus (HIV)-positive pregnant women, the aim of this study was to describe the sexual and reproductive health (SRH) needs and concerns of these women during the COVID-19 pandemic.

Material and methods: This qualitative study was conducted with a content analysis approach to examine the SRH needs and worries of HIV-positive pregnant women during the COVID-19 pandemic. A total of 15 HIV-positive women participated in this study, including seven women with a history of pregnancy and eight women currently pregnant during the COVID-19 pandemic, presenting to Behavioral Diseases Counseling Center of Imam Khomeini Hospital Complex. In total, in-depth, 17 semi-structured, individual interviews were employed to collect data. Purposeful sampling was used with maximum diversity, and continued until reaching data saturation.

Results: Content analysis of interviews was performed according to steps proposed by Zhang and Wilde-muth, and resulted in three main categories and eight sub-categories. Main categories included increased fear of death, concern about the effect of COVID-19 on the fetus, and issues and problems in accessing appropriate prenatal services.

Conclusions: The findings of the present study can help health planners implement more effective interventions to support and care of HIV-positive pregnant women during outbreaks, such as COVID-19 or similar health crises.

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Introduction

COVID-19 is a global public health emergency. The first case of pneumonia caused by this virus was reported in De-

ember 2019 in Wuhan, China. The infection has spread rapidly throughout the rest of China and to the whole world. According to WHO report, from that date until September 5,

Address for correspondence: Dr. Leila Asadi, Department of Midwifery and Reproductive Health, Faculty of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran, e-mail: lasadi@tums.ac.ir

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2022, a total of 601,189,435 cases of COVID-19 infection have been identified, and 6,475,346 deaths have resulted from the disease. In early September 2022, the number of infections in Iran has reached more than 7,500,000, and the number of deaths about 144,000 cases [1].

Pregnant women might be at increased risk of SARS-CoV-2 infection, and may face more complex clinical events [2]. With the continuous increase in the number of cases and death rates in all countries and regions of the world, the role of preventive measures has become more highlighted, and focusing on vulnerable groups has become of great importance [3]. Infection with various types of coronaviruses has been associated with maternal and fetal complications [4-7].

Human immunodeficiency virus (HIV) is still a major global health challenge, with an estimated number of people living with HIV as 37.9 million. Approximately, 1.7 million new cases were reported in 2018. Despite the progress in curbing the HIV epidemic in many developed countries, it still affects many people's health, mostly those in developing countries with limited resources who die due to HIV infection.

In the Middle East and North Africa (MENA) region, where Iran and 19 other countries are located, the number of both new HIV infection cases and AIDS-related deaths increased from 2010 to 2015, which diverges from the global decreasing trend. Although Iran is a pioneering country in the implementation of HIV control program in the Middle East region, the increase in the prevalence of HIV infection in Iranian women in recent years has increased the possibility of mother-to-child transmission. According to the estimates of the Ministry of Health of Iran, the number of children born to mothers with HIV has increased and reached about 470 newborns until 2020. Therefore, controlling HIV infection in women and children is one of the main priorities of HIV control program in Iran [8].

Sexual and reproductive health (SRH) and related rights are an important public health issue during pandemics. There is limited scientific evidence on the impact of COVID-19 on SRH, including clinical manifestations and outcomes of infection during pregnancy, or in people with STI/HIV-related immunosuppression. One should not neglect the effects of the disease on the development of disorders or interruptions in regular provision of SRH services, such as pre- and post-natal check-ups, safe abortion, contraception, and prevention of HIV/AIDS and STIs. Additionally, other aspects are also crucial, such as potential increase in gender-based violence and domestic abuse, stigma and discrimination associated with COVID-19 as well as its impact on SRH service recipients and healthcare providers [9]. Furthermore, sexual and reproductive rights are one of the important aspects, which have been largely neglected in HIV-positive women. HIV patients feel guilty that their behaviors (especially sexual behaviors) can endanger others. The feeling of cultivating a communicable agent in the body makes the patient consider herself/himself an outcast and rejected person. As a result, these people do not seek to understand or meet their needs [10].

The number of HIV-positive women in countries with a Muslim majority populations has increased significantly over the past decade. These women are often marginalized and their SRH needs are not met, mainly due to socio-cultural and religious contexts of their societies, and the way health services are provided for this group [11].

The COVID-19 pandemic has affected the delivery of global health services, including HIV services. Countries with a high prevalence of HIV should limit visits to health facilities to minimize the risk of COVID-19 transmission and at the same time, provide essential HIV prevention, testing, and treatment services without interruption. Many of these mechanisms have not been able to adequately meet the needs of pregnant and nursing women, infants, children, and adolescents in societies with limited resources. Protecting pregnant and nursing women, infants, children, and adolescents against SARS-CoV-2 infection while maintaining essential HIV services, is a global health challenge [12]. There is a high prevalence of depressive symptoms and other mental health vulnerabilities among HIV-positive pregnant women worldwide, and these symptoms and vulnerabilities are associated with an increased risk of adverse pregnancy outcomes and reduced quality of life [13]. Women who experience HIV-related stigma, anxiety, negative attitudes about antiretroviral drugs, and low social support, are significantly more likely to experience suicidal ideations during pregnancies, and are therefore vulnerable and in need of supportive interventions [14]. Maternal HIV infection in women who have not received antiretroviral therapy is associated with pre-term delivery, low birth weight, low gestational age, and stillbirth [15]. Therefore, appropriate management should be implemented to reduce HIV consequences in pregnancy. Ideally, pre-conception counseling and pregnancy planning should begin when the viral load is minimal. Nonetheless, HIV-positive mothers tend to delay their prenatal care due to fear of being humiliated and blamed by healthcare providers [16, 17].

COVID-19 can act as a dual threat to health management in people living with HIV, causing damage at both individual and national levels [12]. Considering the more complicated physical and mental problems of HIV-positive pregnant women during the COVID-19 pandemic, this study was conducted to describe the SRH needs of these women during pregnancy. Identifying the SRH needs and concerns of this population can help health planners and policy-makers develop practical programs based on the priorities.

Material and methods

The present study was conducted at the Behavioral Diseases Consultation Center of Imam Khomeini Hospital Complex, from April 15 to August 22, 2022, using a qualitative approach and conventional content analysis. Conventional content analysis is usually applied for qualitative studies, aiming to describe phenomena about which there are limited research studies. The researchers extracted categories and sub-categories from codes obtained from interviews. A total of 15 HIV-positive women participat-

ed in this study, including seven women with a history of pregnancy and eight currently pregnant women during the COVID-19 pandemic. The sampling method was purposive with maximum diversity, and continued until data saturation.

Inclusion criterion was signing a consent form for participation in the interview and having it audio-recorded. In this study, data saturation was reached after 17 interviews. Participants were assured that they could withdraw from the study at any time, and all information would remain confidential. Data collection was performed through in-depth and semi-structured individual interviews, which were held at a place and time convenient for participants after obtaining their informed consent. Health protocols were observed during interviews to ensure safety in the COVID-19 pandemic. The interview started with the researcher familiarizing herself with the participants, gaining their trust, and continued with a brief explanation about the importance of the research subject and concept of health in a language comprehensible for participants. During the interview, the participant was inquired to express her SRH needs and concerns. The next questions were related to her initial answers and the interview guide. The interview continued with exploratory questions, such as “What do you mean?”, “How?”, “Why?”, and “Please elaborate”. At the end, the participant was asked if there was anything left to say.

The number of interview sessions was selected depending on the conditions of participants and their answers to research questions. Interviewees number 9 and 11 needed an extra interview session, therefore, 17 interviews were conducted with 15 participants. The recorded interviews were transcribed on the same day and then coded. The next interview was performed after analyzing the previous one. Some of the interview questions were as follows:

- What do you know about SRH?
- What do you know about the new coronavirus or COVID-19?
- How did you feel since you found out that this virus has entered our country?
- What concerns and worries have you been facing after the authorities declared this virus a pandemic?
- In your opinion, what kind of attention does an HIV-positive pregnant woman need during this period?
- If you were not HIV-positive, how would your SRH needs be different during the COVID-19 pandemic?

The Lincoln and Guba criteria, including credibility, dependability, transferability, and confirmability, were applied to determine the precision of qualitative data [18]. To confirm their accuracy, the extracted codes were returned to the participant for confirmation or correction as a member check. Dependability was approved through assessment by the research team members and experts as peer check. Data transferability was accepted through a complete presentation of the research methodology along with examples of participants' statements, so that others could follow the research path.

Analysis

Content analysis of the interviews was carried out according to the steps proposed by Zhang and Wildemuth (2009) [19]:

- Data preparing (conducting and transcribing interviews): At this stage, audio-recorded interviews were transcribed. All interviews were transcribed to reveal a clear model of thoughts, behaviors, ideas, and experiences of the study participants.
- Defining and categorizing units of analysis: Each interviewed text was entered into a qualitative data analysis software as a unit of analysis. Before coding, the entire text of the interview was read several times, so that the researcher became fully familiar with the data. They were then coded by defining the meaningful units.
- Developing categories and a coding scheme: At this stage, a scheme was designed for the development of categories and sub-categories. Categories were inductively extracted from the codes, which were first placed in sub-categories according to their similarities. Sub-categories were then grouped based on their relationship with each other to form main categories. The categories were organized to have internal consistency and external inconsistency.
- Testing coding scheme on a sample of text: For this purpose, the researcher coded a sample of text, so that two members of the research team could control coding consistency. Disagreements in coding rules or code classification were resolved by discussion among the research team.
- Coding the entire text: After the researcher and two members of the research team agreed on the consistency of coding, a repeatable process was achieved and the coding process was extended to the entire text. During the coding process, the researcher continuously monitored the coding process to ensure that there was agreement between the codes extracted based on the researcher's inferences and the opinions of participants and the research team.
- Assessing coding consistency: After coding the entire text, coding consistency was checked again. During the analysis process, the researcher checked coordination of coding, including primary codes, their assigning to sub-categories, and development of categories, with other people, including two members of the research team and qualitative research specialists.
- Drawing conclusions from coded data and reporting: At this stage, characteristics and dimensions of the categories were discovered, and relationships between them were determined [19].

MAXQDA software (version 18.0, VERBI Software GmbH, Berlin, Germany) was used for data analysis.

Ethical considerations

Sampling was performed after obtaining an approval of the Research Council of the School of Nursing and Midwifery of Tehran University of Medical Sciences, and receiv-

ing a permission from the Ethics Committee of this University (code No. of ethics: IR.TUMS.FNM.REC.1400.202).

Results

After conducting 17 interviews with 15 subjects, 819 raw codes were extracted. The results were classified into three main categories and eight sub-categories. Table 1 presents the participants' characteristics, and Table 2 shows the extracted categories and sub-categories. Based on the 17 interviews conducted, we found that HIV-positive women who were or have been pregnant during the COVID-19 pandemic suffered from issues, such as increased fear of death, concern about the effect of COVID-19 on the fetus, baby, and child as well as problems in accessing appropriate prenatal and midwifery services.

Increased fear of death

This category had two sub-categories: Fear of death due to COVID-19, and fear of death due to HIV infection.

Fear of death due to COVID-19

Waking up every day with news about thousands of deaths caused by COVID-19 can take its toll on people's health, especially HIV-positive pregnant women. Fear of death exists in all human beings; however, in sensitive situations, this fear becomes more prominent.

An HIV-positive woman who has experienced pregnancy during the COVID-19 pandemic said:

"I was constantly worried about getting COVID-19 and dying." (Participant No. 5).

A 32-week pregnant woman said:

Table 1. Participants' characteristics

| No. | Age (years) | Level of education | Gravidity | Parity | Abortion | Gestational age (weeks)/history of pregnancy during the pandemic | Way of HIV transmission | Interview duration (min:sec) |
|-----|-------------|--------------------|-----------|--------|----------|--|-------------------------|---|
| 1 | 29 | High school | 1 | 0 | 0 | 34 | Sexual | 41:30 |
| 2 | 32 | Diploma | 2 | 1 | 0 | 28 | Sexual | 39:45 |
| 3 | 30 | Bachelor's degree | 2 | 0 | 1 | 32 | Sexual | 55:30 |
| 4 | 32 | High school | 2 | 1 | 0 | 12 | Sexual | 35:34 |
| 5 | 35 | Diploma | 2 | 1 | 1 | History of pregnancy during the pandemic | Unknown | 45:00 |
| 6 | 31 | High school | 2 | 1 | 1 | History of pregnancy during the pandemic | Sexual | 42:43 |
| 7 | 33 | Diploma | 5 | 2 | 3 | History of pregnancy during the pandemic | Contaminated syringe | 50:36 |
| 8 | 31 | High school | 3 | 2 | 1 | History of pregnancy during the pandemic | Sexual | 48:33 |
| 9 | 25 | High school | 1 | 0 | 0 | 32 | Unknown | First interview: 35:20 Second interview: 25:01 |
| 10 | 23 | Diploma | 1 | 1 | 0 | History of pregnancy during the pandemic | Sexual | 56:42 |
| 11 | 26 | Bachelor's degree | 2 | 1 | 1 | History of pregnancy during the pandemic | Sexual | First interview: 40:15 Second interview: 20:27 |
| 12 | 32 | Diploma | 2 | 2 | 0 | History of pregnancy during the pandemic | Sexual | 32:32 |
| 13 | 27 | Diploma | 1 | 0 | 0 | 36 | Sexual | 48:00 |
| 14 | 37 | High school | 1 | 1 | 0 | 27 | Sexual | 72:12 |
| 15 | 29 | Bachelor's degree | 0 | 0 | 0 | 32 | Sexual | 67:13 |

Table 2. Categories and sub-categories resulting from the research

| Categories | Sub-categories |
|--|---|
| Increased fear of death | Fear of death due to COVID-19 Fear of death due to HIV infection |
| Concern about the effect of COVID-19 on the fetus, baby, and child | Concerns about the side effects of HIV and COVID-19 treatment drugs on the fetus Concerns about the cumulative effects of COVID-19 and HIV on pregnancy Concerns about the child's future |
| Issues and problems in accessing appropriate prenatal and midwifery services | Not receiving health services due to economic issues Not receiving midwifery services due to stigma Lack of awareness about care needs during pregnancy |

"Sometimes when I go to crowded places, I hold my breath for fear of COVID. I'm scared! You know! I'm so scared! Because I think that if I, who am HIV-positive, get COVID, I will definitely die." (Participant No. 9).

Fear of death due to HIV infection

Considering that HIV targets human immune system, it can make a person susceptible to other diseases. Since the beginning of the COVID-19 pandemic, serious warnings were given to people with weak immune systems and underlying diseases. HIV-positive pregnant women were feeling increasingly fearful, because in addition to pregnancy, which itself weakens the immune system, infection with COVID-19 targets the immune system, and therefore, this group suffered from an increased fear of death due to HIV.

A 32-year-old pregnant woman who has experienced pregnancy during the COVID-19 pandemic said:

"The AIDS virus is itself scary, let alone in this COVID situation! I'm really afraid that one day AIDS will take my life and make my children orphans." (Participant No. 12).

Another participant said:

"Well, you know, I'm not too scared of death for my own sake. I've prepared myself for death since a long time ago, but I want to stay alive because of this girl. Having no mother is so bad; my child will be burdened!" (Participant No. 5).

Concerns about the effect of COVID-19 on the fetus, baby, and child

This category had three sub-categories, including concerns about the side effects of drugs on the fetus, about the cumulative effects of COVID-19 and HIV on pregnancy, and concerns about the child's future.

Concerns about the side effects of HIV and COVID-19 treatment drugs on the fetus

One of the concerns discussed by HIV-positive pregnant women related to the side effects of antiretroviral therapy (ART) drugs taken concurrently with COVID-19 medicines.

A 27-year-old pregnant woman said:

"We don't know what to do; if we take medicines, we fear that our child will be affected; if we don't take medicines, they say your child will get infected." (Participant No. 13).

Another participant said:

"I got COVID-19 during my pregnancy. I went to the doctor late because I was scared of them giving me medicines, since we already take a lot of medicines as you know! I used to say to myself that my child will eventually develop a defect." (Participant No. 15).

Another woman said:

"If we got COVID, it would be very awful! Both these AIDS and COVID drugs together, only God knows what would have happened to the child in my womb!" (Participant No. 10).

Concerns about the cumulative effects of COVID-19 and HIV on pregnancy

Women with HIV experience stressful conditions during pregnancy due to the psychological impact of this disease, and their concerns can grow enormously if they develop another disease concurrently. The new and unknown SARS-CoV-2 virus along with chronic HIV infection, have led to concerns about pregnancy complications due to simultaneous infection with COVID-19 and their underlying diseases.

A pregnant woman with the experience of being pregnant at the same time as getting infected with COVID-19 said with desperation:

"I kept saying to myself that either my child or me will develop a problem. As if our AIDS problem was not enough, this virus was added to worsen the situation!" (Participant No. 8).

A mother of two children who has had a similar experience said:

"Yes, well, when I got COVID, I didn't know if I should take care of my HIV or COVID-19 - two viruses! God! I will definitely develop many complications, but the child developing a defect was my worst nightmare." (Participant No. 7).

Concerns about the child's future

One of the concerns of HIV-positive mothers is the future of their children who would experience the stress

of the COVID-19 pandemic during the fetal period and after birth, in addition to the stress and challenges imposed by their mothers' illness.

One of HIV-positive women who has experienced pregnancy and COVID-19 at the same time, said:

"Because I got COVID during pregnancy, I fear that my child will develop autism or hyperactivity later on. I don't know what will happen later, I'm scared. May God help us." (Participant No. 11).

Another participant with similar conditions said:

"Now the doctors say that my child is healthy, but it is not clear what will happen in the future, nothing is clear. I'm afraid that in a few years this child will develop something." (Participant No. 5).

Issues and problems in accessing appropriate prenatal and midwifery services

This category had three sub-categories, including not receiving prenatal care due to economic issues, not receiving prenatal care due to stigma, and lack of awareness about care needs during pregnancy.

Not receiving prenatal care due to economic issues

Economic problems are considered the obstacles in receiving health services. HIV-positive pregnant women admitted that they neglected pursuing their treatment and health services due to economic problems.

A 29-year-old pregnant woman said:

"These days, it costs a lot, even when you just catch a cold and go to buy a simple pill and syrup; we live far from the center, so we can't come to Tehran for a visit every time we catch a cold." (Participant No. 1).

Another participant said:

"You empty your pocket by just stepping foot outside the house. Everything is expensive: food, fruits, and all essential items. Doctors and medicines cost a lot too... Yes, I don't have insurance!" (Participant No. 3).

Not receiving midwifery services due to stigma

Stigma is one of the main obstacles in achieving health goals among HIV patients. HIV-positive pregnant women avoided going to health and treatment centers due to the fear of stigma.

One of the infected pregnant women said:

"The truth is, the center's midwife would give me an appointment time to go and see her, and she would call me and remind me too, but I didn't go regularly; I don't like to go there a lot, I'm afraid someone will see me, it's too hard for me going to a place with a big sign saying, 'Behavioral Diseases Counseling Center'. Well, people see you in the hospital yard... I think that now some uninformed people are even more afraid of us. They think that because there is

COVID, we are more dangerous to them! However, AIDS is not transmitted like COVID! It's a shame! Why don't they know?." (Participant No. 2).

Another HIV-positive pregnant woman said:

"One time, I wanted to see an infectious disease specialist; they gave me a red file to go to another building for a visit. I went to the yard and only busied myself around for a while and came back, because you get embarrassed! By the time you enter the building, with that red file in hand, all the doctors and nurses and everyone will know that you have AIDS from far away!" (Participant No. 9).

Lack of awareness about care needs during pregnancy

The lack of awareness about care needs during pregnancy is one of the obstacles in health during this period that causes problems. If pregnant women are aware of their care needs, they can enjoy their pregnancy with fewer complications and better health.

A woman who has experienced pregnancy during the COVID-19 pandemic said:

"I found out I was HIV-positive during my pregnancy; when they told me, I thought it was over and my baby would be infected too. I came to the center too late for receiving prenatal care. The center's midwife told me that if I had come from the beginning and had taken medicines, I wouldn't have been so stressed about my child's health. I used to tell myself, 'What bad luck!' Now that people are dying from COVID, I also have an incurable and dangerous disease. I wish I hadn't got pregnant!" (Participant No. 10).

Another participant said:

"If I haven't had come to this center, I wouldn't had known at all that the child should also take medicines and what care he would need! They did not tell us this at all in the hospital... I don't know now... Maybe they said it and I wasn't paying attention, but I don't remember. Thank God there is this midwife".

Discussion

The findings obtained from the 17 interviews with HIV-positive women who were pregnant at the time of the interview or had a history of pregnancy during the COVID-19 pandemic, showed that SRH concerns during this period included additional fear of death, concern about the effect of COVID-19 on the fetus, baby, and child as well as issues and problems in accessing appropriate prenatal and midwifery services.

Most of the existing studies on the effects of COVID-19 pandemic on pregnant women emphasize maternal and fetal complications as well as preventive and therapeutic measures in this high-risk group, while the needs and concerns of HIV-positive pregnant women in this stressful time are mostly neglected [5, 20-22].

Attention to high-risk groups is an important part of managing health crises. As the number of pregnant women

with COVID-19 is increasing [23], focusing on this group has become an essential part of health service delivery. COVID-19 has recently been recognized as a major threat to human health, with infections ranging from asymptomatic to severe (increased respiratory rate, hypoxia, and significant lung involvement in the CT scan), or even critical (multiple organ failure, or dysfunction and respiratory failure requiring mechanical ventilation or high-flow nasal cannula). Current evidence suggests that pregnant women are at an increased risk of the severe type of the disease, particularly requiring hospitalization, ICU admission, and mechanical ventilation. Management of this infection, especially in combination with another pathogen, may become even more complicated during pregnancy. Preliminary data on the effects of RNA of viruses, such as HIV and hepatitis C on immune responses to COVID-19, suggest that the host immune response to this novel coronavirus may be delayed [24, 25].

Underlying diseases, e.g., HIV infection, associated with immune system weakening, can worsen the conditions of pregnant women infected with coronavirus. Moreover, these women's visits to prenatal care centers and other health and treatment centers during the pandemic increase their risk of infection with COVID-19, thereby making them facing additional challenges as caregivers of their children and other family members [26, 27].

Our study showed that HIV-positive pregnant women exhibit an increased fear of death during the COVID-19 pandemic. Fear of dying from HIV is an issue with which the patients deal on a regular basis. During the pandemic, the fear of co-infection with COVID-19 has doubled the fear of death in this group [28-30].

According to studies, women living with HIV (WLWH) have a high vulnerability to COVID-19, especially at the beginning of the pandemic. These women thought that if they get infected with COVID-19, its comorbidity with HIV would lead to worse outcomes. Moreover, some strongly believe that they would die of COVID-19 [31-34].

In a study by West *et al.* [37], many participants expressed their fear of the increased stressful burden associated with co-infection with COVID-19 and HIV, and noted that this fear was mostly due to their immunocompromised status. Several participants discussed the misinformation circulating in the community, such as people with HIV not being able to survive COVID-19. This misinformation incited and intensified the fear of COVID-19 in people with HIV [35]. Concerns about the effect of coronavirus on the fetus, baby, and child of the participants of our study included side effects of the drugs on the fetus, effects of COVID-19 on pregnancy, and child's future. In a qualitative study by Behbudi *et al.* [36] investigating the experience of pregnancy in HIV-positive women, the participants expressed having continuous concerns about the virus transmission to the baby, effects of pregnancy on their own health, HIV-related stigma, and the disruption of their relationships with healthcare providers.

HIV-positive people are concerned about the access to ART, and worry about the unintentional disclosure of their

HIV-positive condition in life situations determined by COVID-19 quarantine. Because of their immunocompromised condition, they fear death if they catch COVID-19. The poor economic condition of HIV patients has also worsened due to social distancing measures imposed during the COVID-19 pandemic, causing additional psychological stress [37, 38]. Other studies suggested that pregnant women with HIV may experience multiple additional stressors, including economic hardship, reduced social support, and concern about physical health of their children. These additional stressors may increase the risk of postpartum depressive symptoms among HIV-positive women [39-42]. Similarly, WLWH are more likely to experience depression if they are unemployed, financially burdened, or suffer from a common opportunistic infection [43, 44].

Some studies have recommended focusing on interventional strategies, which build resilience, and reduce the psycho-social burden of stigma and depression among WLWH, especially in those who are marginalized [45].

Based on the results of our study, HIV-positive pregnant women have poor access to prenatal care during the COVID-19 pandemic for various reasons, including economic issues, fear of stigma, and insufficient knowledge of special care needs during pregnancy due to their disease.

Some of these women and their spouses have lost their jobs due to the social distancing and quarantine measures for COVID-19 prevention, or were among low-income classes of the society, which led to economic problems and poor access to prenatal care. A qualitative study by Delvin *et al.* [46] investigated psychological and socio-economic factors among HIV-positive women during the COVID-19 pandemic, and found an increase in financial and occupational pressure and childcare responsibilities among these women due to the pandemic. Many of them have been forced to reduce their hours of work or pay rate, while some have lost their jobs completely, and their ability to pay rent and other bills have diminished.

Based on the results of the present study, HIV-positive pregnant women avoided going to health centers to receive prenatal care due to their fear of getting stigmatized. Some people living with HIV abandon self-care because of stigma associated with this disease, while others try to hide their HIV-positive condition due to the fear of getting stigmatized and receiving negative judgment from the society [47, 48]. Due to stigma and shame caused by the negative social burden of this disease, WLWH are exposed to many mental and psychological disorders, which may overshadow their health-seeking behaviors and therapeutic measures, causing irreparable damage [49]. A qualitative study on the experience of stigma in HIV-positive pregnant women reported that almost all the study participants have experienced stigma from their family members, friends, and healthcare providers during pregnancy. Pregnancy was recognized as a stage in life that made HIV-positive women more vulnerable to blame and rejection from others around them. Due to the negative attitude of their healthcare providers, HIV-

infected women faced many problems in accessing health services and supports [36].

Another study showed that HIV-positive people are also treated with suspicion and cynicism by the staff responsible for their treatment and care. Rejection and discrimination are the major obstacles in providing medical services to sick patients. Furthermore, social stigma can adversely affect medical personnel's attitude towards the treatment of these individuals [50].

According to Naji *et al.* [51], HIV-positive patients experience rejection by their spouses, friends, and family, causing more social isolation, feeling of depression, loneliness, and less interest in treatment. These factors prevent many pregnant women from starting and adhering to antiretroviral treatment [52]. Individuals burdened by stigma may take steps to hide their condition, thereby, potentially leading to delays in starting or discontinuing treatments [53]. Other studies also reported verbal abuse, negligence by healthcare workers, and social isolation in HIV-positive pregnant women [54, 55].

Healthcare systems have been recommended to adopt strategies to better support WLWH during the current pandemic and possible future outbreaks. Efforts should include childcare assistance, access to affordable and quality mental health services, WLWH social support groups, and providing education for these individuals, to reduce unfounded fears of being more susceptible to severe COVID-19 [46].

Future research should seek to identify the long-term effects of the COVID-19 pandemic on HIV-positive pregnant women, especially the potential psycho-social and economic consequences experienced by these women. Such studies would be helpful in future pandemics or health crises.

Limitations

One of the limitations of this research, like all qualitative studies, is the lack of generalizability of the findings; however, we tried to minimize this limitation through purposive sampling with maximum diversity. Another limitation related to socio-cultural problems of people's self-reporting is not reporting all the facts, especially during face-to-face interviews. Nonetheless, in this study, we attempted to gain participants' trust as much as possible by establishing proper communication and showing interest in what they were saying.

Conclusions

The current study found that the COVID-19 pandemic and the measures taken to control the pandemic have exacerbated the unique psychological stressors of HIV-positive individuals. Considering the consequences of the COVID-19 pandemic on mental health of these people, the healthcare system should pay more attention to HIV population, trying to meet their support needs. The awareness and understanding of these concerns can help developing interventions to

support HIV-positive pregnant women to better guide HIV care during pregnancy and postpartum in stressful times, such as the COVID-19 pandemic. Healthcare systems are recommended to use strategies and interventions, including childcare, mental health services, support groups, education, and continuous HIV care systems to better support HIV-positive pregnant women in social and clinical networks and reduce potential discrimination, since the return of the pandemic or emergence of other health crises are always possible in the future. Policy-makers' involvement in COVID-19 and neglecting special diseases, such as HIV/AIDS can affect the targets set for managing HIV in the population, and delay the progression of prevention and treatment programs targeting this group. Therefore, the issues expressed by HIV-positive pregnant women indicate and should initiate the development of a road map for policy-making and planning.

Disclosures

1. Institutional review board statement: This study was approved by the Ethics Committee of the School of Nursing and Midwifery of Tehran University of Medical Sciences (code No. of ethics: IR.TUMS.FNM.REC.1400.202).
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