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RESEARCH ARTICLE

Assessing the Attitude of Women Towards Pregnancy, Childbirth, and Child Care during the COVID-19 Pandemic (A Cross-sectional Study)

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Abstract:

Aim:

This study assessed the attitude of mothers toward pregnancy, childbirth, and child care during the COVID-19 pandemic, given the significance of women's attitudes toward these parameters and the paucity of relevant national studies.

Background:

Pregnant women are among the most high-risk groups for developing COVID-19, and the pandemic may affect the attitude of pregnant women towards pregnancy, childbirth, and child care.

Methods:

This cross-sectional study was built on the census method to enroll 192 women admitted to comprehensive health centers in Khaf City, Iran, in 2021. The data were collected using an electronic questionnaire and analyzed using an independent t-test, one-way analysis of variance (ANOVA), and Tukey's post-hoc test. P-values < 0.05 were considered significant.

Results:

The majority of the participants were 30 years old or younger. The mean attitude towards pregnancy, childbirth, and child care (APCCC) score of the participants was 19.21 ± 8.49. Significant differences were found between the mean APCCC score and the mean scores of APCCC subscales in those with and without a history of developing COVID-19, a family member with COVID-19, a history of hospitalization for COVID-19, and a family member with a history of hospitalization for COVID-19 ($P < 0.001$).

Conclusion:

Negative APCCC can lead to population challenges and a decline in the birth rate; therefore, relevant authorities must take necessary steps to address this critical problem.

Keywords: Pregnancy, Childbirth, Child care, COVID-19, Pandemic, Women, Comprehensive health service centers.

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1. INTRODUCTION

In December 2019, a new type of coronavirus was identified in Wuhan, Hubei Province, China, which resulted in severe pneumonia of unknown etiology in humans [1]. Known as COVID-19, the disease has become more prevalent among humans than previous coronaviruses due to its high contagiousness [2]. On January 30, 2020, the World Health Organization (WHO) declared the COVID-19 pandemic an international public health emergency [3].

COVID-19 has posed numerous challenges to society and health care providers and changed people's attitudes toward various aspects of life [2]. Because of these challenges, people may have difficulty accepting and fulfilling their family roles. This especially raises concerns about the health of sensitive

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groups such as pregnant women [4 - 6].

Childbirth is the most important part of pregnancy, in which a mother gives birth to one or more babies. Natural childbirth is a low-tech method of allowing human nature to take its course. A narrow pelvic outlet, functional uterine disorders, or special fetal conditions (*e.g.,* large babies or breech presentation) may require the surgeon to perform a cesarean section (CS). CS is an unnatural form of birth in which the child is born by incisions in the mother's abdominal wall and uterus. This surgical method facilitates delivery in special situations where a pregnant woman cannot give birth naturally for medical reasons [7, 8].

Birth is a social event and probably the happiest in parents' lives. The postpartum period is a unique [9], temporary, and potentially stressful period [10] that can be both satisfying and fraught with vulnerability and crisis. Mothers need to assume new roles and responsibilities during this period [11, 12].

For mothers, dealing with an infant is a major challenge. Azizzadeh Forouzi *et al.* (2010) identified bathing, diapering, dressing the infant, and caring for the baby's umbilical cord as mothers' primary postpartum stressors [11]. According to Bennett, restricted social life and lack of leisure time are the major concerns of mothers during this period [12, 13].

In studies on American women of childbearing age, Hung (2010) and Affonso (1990) concluded that the baby's well-being and comfort were the most common stressors for pregnant women [14, 15]. Liang (2005) identified the baby's health and well-being as the most important stressors during the postpartum period [16]. Moreover, infants of severely stressed mothers are more irritable and restless than those born to normal mothers. These infants may also suffer from nutritional problems, nausea, vomiting, excessive crying, and sleep deprivation [17]. In addition, excessive attention to the infant may cause some mothers to feel extremely lonely and severely anxious [12, 18].

Because of their weak immune systems, people with underlying conditions are highly affected by COVID-19. Accordingly, pregnant women are particularly susceptible to infections due to physiological changes during pregnancy [19].

These physiological changes prevent fetal rejection by reducing acute inflammatory immune responses. However, the changes in the cardio-pulmonary immune system of pregnant mothers make them more susceptible to severe respiratory disease than others [20].

On the other hand, some mechanical and biochemical factors affect mothers' gas exchange and pulmonary function and reduce their residual functional capacity and volume during pregnancy [21]. These issues have raised great concern about the serious impacts of COVID-19 on pregnant women [22] and their infants [21, 23].

Pregnant women are among the most high-risk groups for developing COVID-19, and the pandemic may affect the attitude of pregnant women towards pregnancy, childbirth, and child care. In addition, no researcher has yet examined the attitude of pregnant women towards these parameters during the COVID-19 pandemic. Therefore, this study was carried out to assess the attitude of women admitted to comprehensive health centers in Khaf city towards pregnancy, childbirth, and child care during the COVID-19 pandemic.

2. MATERIALS AND METHODS

This cross-sectional analytical study was conducted in 2021 in Khaf City, Iran. The authors used census sampling to enroll 192 women visiting comprehensive health centers to receive pregnancy care.

The inclusion criteria included signing the informed consent form, being able to read and write, having access to a cellphone to download and complete the questionnaire, and having no medical condition threatening maternal or fetal health (*e.g.,* severe preeclampsia, severe heart disease, chronic hypertension, cervical insufficiency, diabetes, and gestational diabetes). Women with incomplete questionnaires were excluded from the study.

An electronic questionnaire was used for data collection. The first part of the questionnaire collected the participants' demographic data, while the second part assessed their attitudes toward pregnancy, childbirth, and child care (APCCC). Health workers working in the comprehensive health centers provided the link to the electronic questionnaire to the pregnant women. Some pregnant women did not have access to smartphones and social media or were unable to download the questionnaire; therefore, health workers completed the questionnaires for each of these women by interviewing them. The researchers answered all questions asked by the participants during data collection.

The Attitude towards Pregnancy, Childbirth and Child Care (APCCC) Questionnaire was developed by Namazi in 1993. In this 18-item scale, items are scored on a three-point Likert scale, including completely (score 2), moderately (score 1), and not at all (score 0). The total APCCC score ranges from 0 to 36.

Total APCCC scores between “0 to 10”, “11 to 18”, and “> 18” indicate positive, moderate, and negative APCCC, respectively. Therefore, lower APCCC scores indicate a greater attitude towards these items.

Subscales of the APCCC questionnaire include:

1. Type of pregnancy (*i.e.,* wanted or unwanted pregnancy) (items 1, 2, 12, 13, 14, 15, 17, and 18)

2. Concern about childbirth (items 3, 4, 5, and 16)

3. Attitude towards the impact of childbirth on work and family life (items 6, 7, and 8)

4. Attitude towards the child (items 9, 10, and 11)

Namazi (1993) assessed this tool's face and content validity with the help of some gynecologists. She also obtained a 15-day test-retest reliability of 0.95 for this scale in a pilot study with 30 women [24, 25]. The data were analyzed in SPSS 22 using an independent t-test, one-way ANOVA, and Tukey's post hoc test. P-values<0.05 were considered significant.

3. RESULTS

The majority of the participants were 30 years old or younger (n = 91, 47.4%), housekeepers (n = 90, 46.9%), and university graduates (n = 93, 48.4%). A total of 84 women

(43.8%) had a history of COVID-19, and 27 (14.1%) had been hospitalized for this disease. In addition, 104 individuals (54.2%) had a family member with a history of suffering from COVID-19, and 52 individuals (27.1%) had a family member hospitalized for COVID-19 infection (Table **1**).

The mean APCCC score of the participants was 19.21 ± 8.49; thus, the women generally had a negative APCCC. The mean scores of type of pregnancy (*i.e.,* wanted or unwanted pregnancy), concern about childbirth, attitude towards the impact of childbirth on work and family life, and attitude towards the child were 6.91 ± 3.37, 5.14 ± 2.48, 3.63 ± 1.97, and 3.54 ± 1.88, respectively. The data had a normal distribution because the skewness and kurtosis values for all research variables were between -2 and 2 (Table **2**).

The mean APCCC score and the mean scores of pregnancy type and concern about childbirth were significantly higher in women older than 35 years than in other pregnant women ($p < 0.05$). However, no significant difference was found between women in different age groups in terms of the mean scores of subscales of attitude towards the impact of childbirth on work and family life and attitude towards the child ($p > 0.05$). The mean APCCC score and the mean scores of APCCC subscales (except for concern about childbirth) were significantly higher in employees than in other women ($p < 0.05$). However, no significant difference was found between women with different educational qualifications in terms of the mean APCCC score and the mean scores of APCCC subscales ($p > 0.05$) (Table **3**).

Table 1. Demographic characteristics of participants (N=192).

Variable	Categorization	Frequency (n)	Percentage (%)
Age (year)	≤ 30 31-35 > 35	91 64 37	47.4 33.3 19.3
Occupation	Housekeeper Employed Self-employed	90 57 45	46.9 29.7 23.4
Education	Primary/secondary High school Tertiary	46 53 93	24 27.6 48.4
History of COVID-19 infection	No Yes	108 84	56.3 43.8
History of COVID-19 in family members	No Yes	88 104	45.8 54.2
History of hospitalization upon COVID-19	No Yes	165 27	85.9 14.1
History of hospitalization of family members upon COVID-19	No Yes	140 52	72.9 27.1

Table 2. The mean APCCC score of participants.

Variable	Mean	Standard Deviation	Skewness	Kurtosis	Level
Unwanted pregnancy	6.91	3.37	-0.23	0.13	Moderate (score between 5-8)
Worried about child birth	5.14	2.48	-0.71	-0.64	negative (score above 4)
Negative attitude towards the impact of the birth of a child on work and family life	3.63	1.97	-0.46	-0.95	negative (score higher than 3)
Negative attitude towards the child	3.54	1.88	-0.29	-0.88	negative (score higher than 3)
Attitude towards pregnancy, childbirth and child care in general	19.21	8.49	-0.80	-0.08	negative (score higher than 18)

Table 3. Comparing the participants' mean APCCC scores based on demographic characteristics.

Variable		Unwanted Pregnancy Y	Worried about Childbirth	Negative Attitude towards the Impact of the Birth of a Child on Work and Family Life	Negative Attitude towards the Child	Total Attitude Score
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age (year)	≤ 30	6.68 ± 3.26	4.66 ± 2.48	3.47 ± 2.08	3.56 ± 1.97	18.37 ± 3.38
	31-35	6.17 ± 3.03	5.45 ± 2.39	3.61 ± 1.83	3.31 ± 1.70	18.55 ± 7.90
	> 35	8.76 ± 3.65	5.76 ± 2.45	4.05 ± 1.88	3.86 ± 1.95	22.43 ± 9.18
P-value related to ANOVA test		0.001	0.03	0.32	0.36	0.04

(Table 3) contd.....

Variable		Unwanted Pregnancy Y	Worried about Childbirth	Negative Attitude towards the Impact of the Birth of a Child on Work and Family Life	Negative Attitude towards the Child	Total Attitude Score
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Occupation	Homemaker	6.98 ± 3.02	5.02 ± 2.30	3.79 ± 1.95	3.64 ± 1.93	19.43 ± 7.79
	Employed	7.81 ± 2.99	5.61 ± 2.02	4.05 ± 1.62	4.14 ± 1.62	21.61 ± 7.24
	Self-employed	5.64 ± 4.11	4.76 ± 3.30	2.78 ± 2.18	2.56 ± 1.74	15.73 ± 10.19
P-value related to ANOVA test		0.005	0.19	0.003	<0.001	0.002
Education	Primary/secondary	6.93 ± 3.25	5.24 ± 2.23	4.04 ± 1.70	3.74 ± 1.77	19.96 ± 7.79
	high school	6.06 ± 3.08	5.26 ± 2.60	3.43 ± 2.01	3.43 ± 2.04	18.19 ± 8.42
	Tertiary	7.39 ± 3.53	5.02 ± 2.54	3.54 ± 2.06	3.49 ± 1.85	19.43 ± 8.89
P-value related to ANOVA test		0.07	0.80	0.25	0.69	0.56
History of COVID-19	No	5.66 ± 3.12	4.40 ± 2.62	3.24 ± 2.17	2.98 ± 1.99	16.28 ± 8.67
	Yes	8.52 ± 2.99	6.08 ± 1.92	4.13 ± 1.55	4.25 ± 1.44	22.99 ± 6.59
P-value related to independent t-test		< 0.001	< 0.001	0.002	< 0.001	< 0.001
History of COVID-19 among family members	No	5.35 ± 3.68	4.06 ± 2.83	2.74 ± 2.15	3.08 ± 2.26	15.23 ± 9.95
	Yes	8.23 ± 2.42	6.05 ± 1.67	4.38 ± 1.42	3.92 ± 1.38	22.59 ± 5.01
P-value related to independent t-test		< 0.001	< 0.001	< 0.001	0.002	< 0.001
History of hospitalization upon COVID-19	No	6.55 ± 3.29	4.89 ± 2.47	3.51 ± 2.03	3.42 ± 1.92	18.37 ± 8.52
	Yes	9.11 ± 3.08	6.63 ± 1.97	4.37 ± 1.31	4.26 ± 1.46	24.37 ± 6.34
P-value related to independent t-test		< 0.001	0.001	0.04	0.03	0.001
History of family members' hospitalization upon COVID-19	No	6.45 ± 3.52	4.70 ± 2.59	3.19 ± 2.05	3.44 ± 2.06	17.78 ± 9.25
	Yes	8.15 ± 2.59	6.31 ± 1.65	4.81 ± 1.03	3.81 ± 1.27	23.08 ± 3.99
P-value related to independent t-test		0.002	< 0.001	< 0.001	0.22	< 0.001
*: A higher score indicates a negative attitude towards pregnant, child birth, and child care.						

Significant differences were found between the mean APCCC score and the mean scores of APCCC subscales in those with and without a history of developing COVID-19, a family member with COVID-19, a history of hospitalization for COVID-19, and a family member with a history of hospitalization for COVID-19 (all p-values < 0.001). In other words, women with a history of developing COVID-19 and those with a history of hospitalization for COVID-19 infection had a more negative APCCC than others. In addition, women who reported the development of COVID-19 in a family member and those who had a family member with a history of hospitalization for COVID-19 had a more negative APCCC than others (Table **3**).

4. DISCUSSION

The attitude of women towards pregnancy, childbirth, and child care during the COVID-19 pandemic or other similar crises can determine women's physical and mental health in society. Moreover, it may reflect the effectiveness of health care, social policies, and incentives to support women and improve population growth rates. So far, no researcher has assessed pregnant women's attitudes towards pregnancy, childbirth, and child care during the COVID-19 pandemic in Iran. Therefore, this was the first study to examine the attitude of a group of pregnant women in Iran towards pregnancy, childbirth, and child care during the pandemic. A total of 192 women visiting comprehensive health centers in Khaf city were selected as the sample. The majority of the participants were 30 years old or younger (n = 91, 47.4%), housewives (n = 90, 46.9%), and university graduates (n = 93, 48.4%). A total of 84 women (43.8%) had a history of COVID-19, and 27 (14.1%) had been hospitalized for this disease.

The studied women generally had a negative APCCC. This is probably due to the considerable pressure the pandemic has put on women, making them very anxious and worried about the future. The most common concerns of women during the pandemic include fear of pregnancy, restrictions on visits to physicians, purchase of medications, difficult working conditions, uncertainty, stress, anxiety, frustration, fear of childbirth and hospitalization, fear of developing COVID-19 and infecting the child, and problems with child care under quarantine conditions.

In line with this finding, some studies conducted in different parts of Iran have found that the two-child pattern has become very popular in Iranian families and that the majority of women are unwilling to bear a child [26 - 29]. In addition, according to some local studies, more than 60% of Iranian women do not intend to have children [30 - 32]. Moreover, in research carried out in Tehran, about 63% of women did not desire to have children [33].

Inconsistent with the present result, Khadivazadeh *et al.* [34] and Piltan *et al.* [28] observed that women had a moderate desire to have children. This discrepancy can be attributed to the use of different measurement tools as well as differences in the conditions of these studies. For example, in contrast to the present research, the studies of Khadivazadeh *et al.* and Piltan *et al.* were not conducted during the COVID-19 pandemic. Furthermore, these studies were carried out in different cities with different cultural, social, and economic conditions.

Several social, political, cultural, and economic factors affect women's desire for pregnancy. This desire is also deeply associated with parents' attitudes towards and knowledge of pregnancy [35]. A more than 50% decrease has been reported in Iranian women's fertility (birth) rate [36]. The COVID-19 pandemic has adversely affected families and societies, as it has negatively changed the attitude of women towards childbearing. As a result, a larger portion of Iranian women is unwilling to have children. Therefore, relevant planners and authorities must take into consideration these negative changes and take measures to reduce the consequences of population decline and population aging in the future.

The mean APCCC score and the mean scores of subscales of type of pregnancy and concern about childbirth were significantly higher in women who were over 35 years of age than in others. In other words, pregnant women over the age of 35 had a more negative attitude towards pregnancy than others.

This is probably due to higher worries of older women about their ability to take care of their children, extreme physical and mental fatigue of women and mandatory restrictions imposed due to the pandemic, uncertainty of women about the future, decreased motivation of older women for pregnancy, increased susceptibility of older pregnant women to COVID-19, and availability of more job opportunities for unmarried women.

During pregnancy, some physiological changes prevent fetal rejection by reducing acute inflammatory immune responses. However, changes occurring in the cardio-pulmonary immune system of pregnant mothers make them more vulnerable than others to severe respiratory diseases; therefore, special attention must be paid to this vulnerable group during the pandemic [20].

Consistent with this finding, Piltan *et al.* found that nearly half of the women in the 15-49 age group do not intend to have another child. Moreover, their ideal number of children was generally fewer than that of their husbands [28]. In addition, Enayat and Parnian [30] concluded that factors such as marriage age and the ideal number of children influence childbearing behavior, as an increase in the marriage age increases the age of the first pregnancy and decreases the number of children. Montazeri *et al.* [37] observed an indirect relationship between women's age and their childbearing desire. Alongside this, Rad and Savabi argue that the variable of age has the greatest effect on women's childbearing tendency [38]. In the study of Motlagh *et al.* [31], older age was a major reason for women's lower tendency to childbearing. In addition, Abbasi and Khajehsalehi [39] found that age strongly explained women's childbearing desire. Finally, Keshavarz *et al.* [40] observed that delayed childbearing was directly related to an older age.

The mean APCCC score and the mean scores of APCCC subscales (except for that of the subscale of concern about childbirth) were significantly higher in employees than in other women; however, no significant difference was found between women with different educational qualifications in terms of the mean APCCC score and the mean scores of APCCC subscales.

In line with the present findings, Bühler and Philipov [41] found that employment significantly reduced fertility rates. However, inconsistent with the results of this study, Bühler and Philipov observed that high educational qualifications significantly reduced fertility rates.

Unlike the present results, Enayat and Parnian [30] concluded that women's employment status does not influence their attitude towards the ideal number of children. Today, the family structure has changed so that women's activities are no longer limited to the home. While doing all kinds of household chores, women also work outside the home. On the other hand, childbearing and related tasks take up a lot of time, and employment may reduce women's ability or motivation to have children while reducing their attention to their children.

Significant differences were found between the mean APCCC score and the mean scores of APCCC subscales in those with and without a history of developing COVID-19, a family member with COVID-19, a history of hospitalization for COVID-19, and a family member with a history of hospitalization for COVID-19. In other words, women with a history of developing COVID-19 and those with a history of hospitalization for COVID-19 infection had a more negative APCCC than others. In addition, women who reported the development of COVID-19 in a family member and those who had a family member with a history of hospitalization for COVID-19 had a more negative APCCC than others.

Due to the lack of similar studies, one cannot compare this finding with the results of other studies. Regarding this finding, it can be argued that women experience severe stress and anxiety when they or one of their family members is hospitalized for COVID-19. In a COVID-19 ward, issues such as prevention of face-to-face visits, uncertainty about the result of hospitalization, and fear of exacerbation of clinical conditions of the patient increase the anxiety of support persons. Therefore, having a history of hospitalization for COVID-19 or having a family member with a history of hospitalization for this disease can adversely change the attitude of pregnant women towards pregnancy, childbirth, and childcare.

CONCLUSION

The COVID-19 pandemic has led to extensive demographic changes in society; negative APCCC is an example. Some demographic challenges arising from this negative attitude include reduced fertility rate, decreased population growth, and drastic changes in family structure; therefore, relevant authorities are advised to understand and carefully monitor this phenomenon in the future. Given the significance of women's health and their undeniable role in the success of society, researchers are suggested to conduct future studies on larger populations.

LIMITATIONS OF THE STUDY

The small study sample size, the inferior psychological conditions of women during the COVID-19 pandemic, and their individual differences may have affected the final results. In addition, since a self-report questionnaire was used to collect the data, the accuracy of the participants' responses is not guaranteed. The researchers were unable to remove all research

limitations completely; however, health workers personally completed questionnaires for those women who did not have access to smartphones and social media by interviewing them.

Since the present research was conducted in one city, the results should be carefully generalized to other populations. In addition, to increase the generalizability of the findings, researchers are suggested to conduct additional qualitative studies on different populations in diverse research environments.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This article reports the results of a research project approved by Mashhad University of Medical Sciences with the code of ethics (IR.MUMS.REC.1400.348).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committees and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

The inclusion criteria included signing the informed consent form, being able to read and write, having access to a cellphone to download and complete the questionnaire, and having no medical condition threatening maternal or fetal health

STANDARDS OF REPORTING

STROBE guideline has been followed.

AVAILABILITY OF DATA AND MATERIALS

Not applicable.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest, financial or otherwise.

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