

Attitudes and Knowledge of Infertile Iranian Couples Among Treatment With Assisted Reproductive Technologies During COVID-19 Pandemics

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Abstract

Objective: The coronavirus disease 2019 (COVID-19) pandemic affected the continuation of all non-emergency medical treatment and patients potentially suffer from restrictions including patients under infertility treatment. This study aimed to evaluate the knowledge and attitudes of infertile couples about continuing assisted reproductive technologies (ARTs) therapy during the COVID-19 outbreak, in Sari, Iran.

Materials and methods: We conducted a prospective longitudinal investigation on potential infertile couples for treatment with ARTs referred to our infertility clinic from March 2020 to June 2020. Ninety-two patients were studied voluntarily and anonymously in this study. A self-developed structured questionnaire was used to assess the attitude towards continuing infertility treatment. A P-value of less than 0.05 was considered statistically significant.

Results: Thirty-two patients (33.33%) had decreased motivation to continue treatment during the COVID-19 pandemic. Fear of transmission to the fetus (28.13%) had the highest frequency among the causes of decreased motivation to continue treatment (P-value = 0.011). Trust on the support of the treatment team (56.67%) was the most common reason for not reducing motivation in patients without decreased motivation (P < 0.001).

Conclusion: Despite the COVID-19 pandemic, in Iran most infertile patients tended to continue ARTs. Although many patients had passable knowledge on COVID-19, the stress of infertility and the high desire of infertile couples to have children did not deter them from continuing their therapy.

Keywords: COVID-19; Assisted Reproductive Technology; Attitude; Infertility

Introduction

In December 2019, unknown pneumonia belonging to

the coronavirus family was reported in Wuhan, China (1, 2). The disease, later known as Coronavirus Disease 2019 (COVID -19) (3), was declared a pandemic in the 51st Situation Report of the World Health Organization because of its rapid spread

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(4, 5). The pandemic led to the lockdown of many cities and social distancing laws, as well as the cancelation of many unnecessary processes (6). Among infertility treatments, methods such as assisted reproductive technologies (ART) have the potential to put pressure on available resources to address the pandemic (6, 7). In addition, in vitro fertilization (IVF), for example, which accounts for 99% of ARTs (6), requires frequent visits to health centers for each IVF cycle, necessitating the use of personal protective equipment and increasing the risk of exposure to COVID -19 (7).

In March 2020, the American Society for Reproductive Medicine (ASRM) recommended stopping the start of new fertility treatment cycles, including ovulation induction, intrauterine insemination, IVF/embryo transfer (fresh and frozen), and non-urgent gamete cryopreservation (8). ASRM has stated that fertility services cannot be withheld ethically from individuals with chronic viral infections (8). Nevertheless, the desire of infertile couples to become pregnant and have children need not necessarily be lost due to a pandemic alone (7). However, in August 2020, ARSM announced that patients who wish to continue treatment can pursue treatment after counseling (9).

Infertility has a significant negative impact on women's mental health (10) and is considered an unpleasant experience (11). The diagnosis and treatment of infertility are known stressors that can cause significant psychological distress (12) and a range of other emotional reactions (13) such as anger, depression, anxiety, and feelings of worthlessness (11). All of these reactions may be worsened by the occurrence of the COVID -19 pandemic (14). Some studies of infertile couples in the COVID -19 pandemic have shown that feelings of helplessness were associated with greater distress after treatment interruption ($P < 0.01$). Higher self-control and perceptions of more social support were associated with less distress ($p < 0.01$) (14). Factors such as occupation, income, longer time to conception, more time to rest at home after treatment, and shorter hospital waiting time were also associated with continued infertility treatment in this pandemic (7). While the social, ethical, and legal issues associated with ART are well documented around the world, including in Asia, many Iranians are unaware of the exact use of this technology (15). Due to the nature of treatment and pregnancy, objective measurement of psychological, social, emotional, and attitudinal effects

on couples using ART is limited (16). The aim of this study is to examine the attitudes and knowledge of these infertile Iranian couples about continuing ART treatment during the COVID -19 pandemic.

Materials and methods

Study design and participants: This prospective longitudinal questionnaire study was conducted after the Ministry of Health's approval to start ARTs at Madar Infertility Subspecialty Clinic on potentially infertile couples who had approached our infertility clinic for treatment with ARTs from March 4, 2020 to June 20, 2020. The questionnaire was filled out in the clinic after the permission of the Ministry of Health to start ARTs. Couples were allowed to fill out questionnaires with each other and share opinions. Diagnostic testing for SARS-CoV-2 in individuals was performed by reverse transcriptase-polymerase chain reaction (RT -PCR) before enrollment. Forty-six infertile couples (92 participants) were screened voluntarily and anonymously in this study. All participants were included in the study by census method. All patients were individuals who had been on record for at least six months and whose treatment had been prescribed by a physician. This project was conducted by the Declaration of Helsinki of the World Medical Association and after approval by the Biomedical Research Ethics Committee of Mazandaran University of Medical Sciences (Ethical code: IR.MAZUMS.REC.1399.7903). All individuals with primary infertility as defined by WHO (17) and candidates for ART were included in the study. Patients who did not agree to participate in the study and those who tested positive for SARS-CoV-2 were excluded.

Data collection: Subjects were interviewed using a questionnaire prepared by a researcher. Illiterate subjects who could not answer the questionnaire were asked the questions orally and noted in the questionnaire. The questionnaire consisted of the following four parts: The first part contained demographic information and clinical characteristics, the second part contained medical records, the third part contained questions on the level of knowledge of coronavirus infection, and the fourth part contained questions on the attitude towards continuing infertility treatment. The scoring system was not intended for questionnaire questions. The validity of this questionnaire was assessed by three infertility specialists using Lavache method, to determine the

content validity ratio, each question was evaluated based on a three-part spectrum in terms of necessity. (Necessary, useful but not necessary, not necessary); Also, to determine the content validity index, each question was evaluated based on three criteria: relevance (relationship of the question with the criterion), simplicity (conciseness and usefulness of the item), and clarity. To perform the reliability process, a questionnaire was administered to 20 participants and confirmed with a Cronbach's alpha of 0.78.

Statistical analysis: The mean ± standard deviation (SD) was used to describe the quantitative data, and the frequency and percentage were used for the qualitative data. The Kolmogorov-Smirnov test was used to assess the normality of the variables. The one-sample t-test, chi-square test, and Fisher's exact test were used to compare the results of the two groups. A P-value of less than 0.05 was considered statistically significant. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 26 software.

Results

A total of 92 patients (46 couples) were included. The mean ± SD age was 35.51±5.51 years with a minimum age of 22 and a maximum age of 50 years. The mean ± SD of men (37.35±5.24) was significantly higher than women (33.67±5.18) (P-value=0.001). The demographic characteristics of the patients are shown in Table 1.

Most women had no previous pregnancy, delivery or abortion (P-value < 0.001). None of the individuals had a history of stillbirth. Four and 11 couples had a history of successful and unsuccessful infertility treatment respectively. Fifteen couples had a history of infertility treatment. The treatment modalities used by 15 couples with a history of treatment included intrauterine insemination (IUI) (66.67%), embryo transfer (86.66%) and follicular aspiration (40.00%). Only two patients (2.17%) experienced symptoms of COVID -19 and none of them were hospitalized and recovered completely.

Sunburst chart of answers to questions of level of knowledge is abstracted in Figure 1 and Table 2 shows the frequency of responses to the patient knowledge questionnaire. The most common method of obtaining information was radio and television (43.48%) (P-value < 0.001). The majority of the individuals selected the use of a mask (55.43%) as the most effective preventive measure (P-value < 0.001).

Table 1: Frequency of demographic characteristics

Variables		P-value
Age, Mean (SD), years		
Man	37.35 (5.24)	0.001
Women	33.67 (5.18)	
Level of Education, N (%)		
Illiterate	2 (2.17)	< 0.001
Less than diploma and diploma	28 (30.43)	
Bachelor	45 (48.91)	
Masters up	17 (18.48)	
Living area, N (%)		
Urban area	72 (78.26)	< 0.001
Rural area	20 (21.74)	
Occupation, N (%)		
Unemployed	29 (31.52)	0.001
University student	12 (13.04)	
With a fixed income	32 (34.78)	
No fixed income	19 (20.65)	
Monthly income, N (%), Million rials		
Less than 20	35 (38.04)	<0.001
20	24 (26.09)	
20 to 50	24 (26.09)	
More than 5	9 (9.78)	
Religion, N (%)		
Muslim-Shia	89 (96.74)	<0.001
Muslim-Sunni	3 (3.26)	
Underlying disease, N (%)		
Diabetes mellitus	4 (4.34)	<0.001
Hypertension	2 (2.17)	

Thirty-two patients (33.33%) had the lower motivation to continue treatment during COVID -19 pandemic. Fear of fetal transmission (28.13%) was the most common reason for decreased motivation to continue treatment (P-value = 0.011).



Figure 1: Sunburst chart of answers to questions of level of knowledge

Table 2: Frequency of answers to questions of the level of knowledge

Questions/Answers	Frequency (%)	P-value
How to get information about the disease?		<0.001
Radio and TV	40 (43.48)	
Newspaper	3 (3.26)	
Internet	33 (35.87)	
Family and colleagues	20 (21.74)	
Doctors, nurses and medical staff	28 (30.43)	
What is the most common symptom of the disease?		<0.001
Fever, cough and shortness of breath	82 (89.13)	
Myocardial infarction, fever and seizures	2 (2.17)	
I do not know	8 (8.70)	
What is the most common mode of transmission?		<0.001
Shake hands	59 (64.13)	
Contact with contaminated discharge	36 (39.13)	
I do not know	8 (8.70)	
From which animal is the disease transmitted?		<0.001
Bat	85 (92.39)	
Mosquito	1 (1.09)	
Dogs and cats	6 (6.52)	
What are the effective methods of prevention?		<0.001
Use a mask	51 (55.43)	
Use gloves	30 (32.61)	
Use of disinfectants in the environment	33 (35.87)	
Consumption of antibiotics	2 (2.17)	
Proper spacing of these people	43 (46.74)	
Regular hand washing and personal hygiene	66 (71.74)	
What are the effective home remedies?		<0.001
Gargle with water and salt	28 (30.43)	
Vitamin intake	21 (22.83)	
Drink hot drinks and beverages	22 (23.91)	
Eat in the environment	5 (5.43)	
Avoid communities	69 (75.00)	
None	3 (3.26)	
What is the correct hand washing time?		<0.001
20 seconds	58 (63.04)	
30 seconds	20 (21.74)	
40 to 60 seconds	14 (15.22)	
How do you assess the impact of the implementation of the law of social distance?		<0.001
Very much	55 (59.78)	
Much	20 (21.74)	
medium	12 (13.04)	
Low	5 (5.43)	

Confidence in the support of the treatment team (56.67%) was the most common reason for not decreasing motivation in patients without decreased motivation (P-value < 0.001) (Table 3).

The majority of patients had a very high or high propensity (65.22%) to continue or start treatment during the pandemic COVID -19. Most of the people had an average fear of getting infected (39.13%). Fear of getting sick by being in the treatment

environment was moderate for most people (39.13%). Fear of adverse effects of coronavirus on pregnancy (35.87%) was also moderate in most people (Figure 2). Examination of the association between patient demographic variables and decreased motivation showed that age, educational level, place of residence, occupation, income, religion and history of underlying disease were not significantly associated with decreased motivation in patients (P-value > 0.05).

Table 3: Frequency (%) of causes of decreased motivation to continue infertility treatment in patients during the COVID-19 pandemic

Decreased motivation	Causes	Frequency (%)	P-value
Yes (n=32)	Fear of transmitting the disease to the fetus	9 (28.13)	0.011
	Fear of getting infected during treatment	7 (21.88)	
	Fear of the negative effect of the virus on the outcome of pregnancy	4 (12.50)	
	Fear of unknown effects of the virus in pregnancy	5 (15.63)	
	Fear of transmitting the disease	7 (21.88)	
No (n=60)	Desire to have children even if there is a risk of transmission of infection	10 (16.67)	<0.001
	Time limit for treatment	16 (26.67)	
	Trust the support of the treatment team	34 (56.67)	

Discussion

To our knowledge, this cross-sectional study is the first to examine the attitudes and knowledge of infertile couples, treatment candidates about continuing treatment during the COVID -19 pandemic in Iran. The level of knowledge of infertile couples and their ability to respond comprehensively to COVID -19 are rather limited in their communities (18). In this study, albeit the propensity to treat infertility with ARTs was expected to decrease due to the COVID-19 pandemic, most patients chose to proceed with treatment. Trust in therapy team support was the main motive for those who desired to hang on treating. The majority of patients who decided to leave treatment had the idea of transmitting the disease to the fetus or becoming infected in medical centers. The time limit of infertility treatment played a key role in this decision.

In this survey, there was no significant association between sociocultural status and lower motivation. We were unable to arrive at this resolution on a significant relationship between socio-cultural status and motivation. However, in an online survey using a

40-item questionnaire in Vietnam, socioeconomic factors such as occupation, working conditions, and income before the epidemic were associated with continued infertility treatment (7). These findings underscore the fact that expansive, multifaceted factors are critical in the decision for and adoption of infertility treatments in the COVID -19 outbreak. Although, demographic variables were not significantly associated with decreased motivation, many studies have shown the undeniable effect of demographic variables on motivation (19, 20).

In a descriptive cross-sectional study enrolled in Pakistan, the role of social media in people's attitudes about COVID-19 was well embossed. Awareness was significantly associated with attitudes, anxiety, depression, and stress, and the deep-rooted effect of social media on individuals' attitudes toward the disease was shown (20). We featured this well in our evaluation. Most of the individuals in the current study had a decent knowledge of COVID-19 and regularly received their data from social media, especially radio and television.

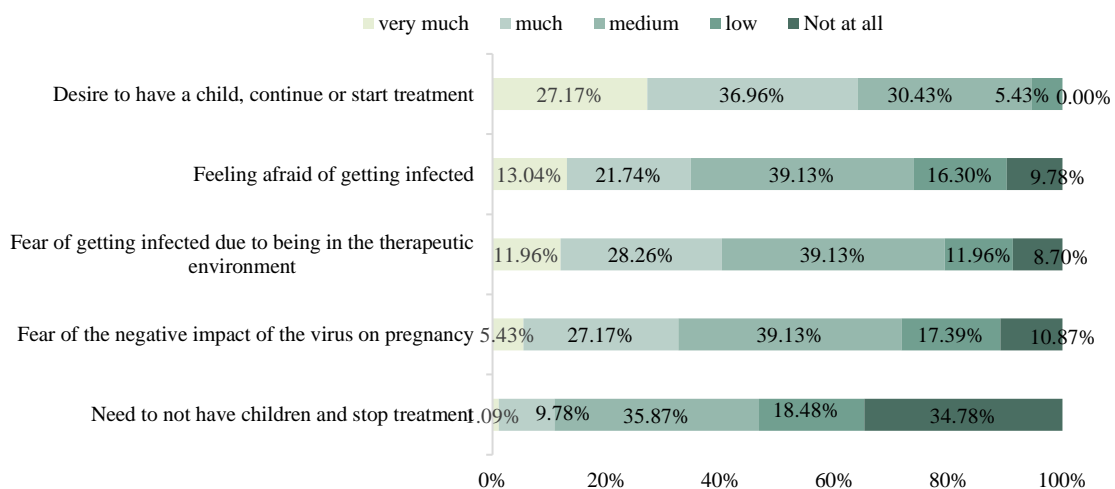


Figure 2: Frequency of attitude level factors of coronavirus infection

Given the high cost of ART, the need for long-term treatment for some couples, and the lack of infertility treatment facilities in all cities and the need for travel, it can be argued that financial considerations may influence couples' attitudes toward starting or continuing treatment (15). Notwithstanding, our outcomes showed albeit many couples earned under \$100, they were ready to begin or proceed with treatment.

IUI and embryo transfer are relatively simple, common, and safe procedures, and the risk of severe complications is low (21, 22). In this study, most patients tended to perform and continue their treatment by IUI despite the fear of the COVID -19 pandemic.

Diagnosis and treatment of infertility cause stress in infertile individuals. Social support, defined as the amount of kindness, help, and attention from family members, friends, and others (23), may play an important role in the development of stress and its management (24). As medical team support is also part of social support in our study, it can be explained why more than half of the patients who had opted for treatment cited support from the treatment team as the most significant reason to treat.

In an investigation of 500 infertility patients in New York, around 82% of patients were ready to begin ARTs with endocrinologist counseling (25). These outcomes and our results show the high inclination of infertile couples to treat and have babies notwithstanding the COVID-19 pandemic and feature the way that barrenness stress dramatically affects proceeding with ARTs (26).

Lack of counseling time in the clinic and the lack of psychological support were rated as inadequate by health care providers. Indeed, a clinic's busy schedule makes it difficult to provide information and psychological support to outpatients (27). Research has shown that health professional supports are exceptionally successful in diminishing the stress and anxiety of people with infertility (28).

Evidence suggests that a social distance of 1 m is associated with a reduction in infection transmission risk of more than 80% (29). In the present study, almost two-thirds of patients considered the social distance to be an effective preventive measure COVID -19. However, some previous studies have shown that observing social distance can lead to increased stress because individuals feel they have less social support (14). Therefore, it can be speculated why in our patients, despite the fact that most of them believed in maintaining social distance,

the fear of contracting COVID -19 in medical centers was only moderate.

Recent studies have reported that the risk of vertical transmission of SARS-CoV-2 in the third trimester is about 3.2% (30). However, transmission of SARS-CoV-2 via sexual secretions and vertically is still under investigation (1). According to the Health Belief Model, because healthy and young infertile individuals are at lower risk for COVID -19 complications, less concern and less willingness to prevent is expected (31). This appears patients who wanted to continue or start infertility treatment opted for fertility treatment before the COVID -19 pandemic despite the obstacles associated with this procedure (14).

In our patients, about 24% experienced unsuccessful infertility treatment. In some reports, unsuccessful infertility treatment resulted not only in immediate heart failure and shock but also in long-term psychological trauma. In these surveys, pregnant women reported that they suffered from severe anxiety due to previous unsuccessful IVF attempts (32, 33).

A notable point in our study was that almost a few patients without the decreased motivation had a desire to have a child, even if there was a risk of transmission. A recent study has shown that the knowledge gap in infertile women in the pandemic of infectious diseases causes a difference in their attitude in choosing the type of treatment and its continuation (34).

The sample size of our study was small. Another limitation was the use of a questionnaire, which may prevent the expression of deep feelings. Using interviews to gather information from a couple in person allows researchers to examine dual relationships between couples. Studying a more homogeneous group allows researchers to gain a deeper understanding of the cultural context and its impact on infertile couples' attitudes toward continuing treatment. Studies comparing the differences between infertile couples in different cultural groups in Iran may be helpful in the future. Therefore, the results of this study cannot be generalized to all people using ART or to all regions of Iran, although they may be applicable in similar settings. Future research with larger samples is needed to consider other factors that may influence the experiences of infertile couples and to reach appropriate conclusions.

Conclusion

In this study, most patients had an acceptable

knowledge of COVID -19 and its transmission risk in medical centers. However, most individuals desired to continue ART in this pandemic.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

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