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Evaluation of Infertility-related Stress and its Associated Factors in Infertile Clients: A Cross-Sectional Study

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Abstract

Background: Infertility is a painful emotional experience associated with stress.

Objectives: The present study aimed at determining infertility-related stress and its associated factors in infertile clients referred to the infertility clinic of Al-Zahra hospital in Rasht, Iran, in 2019.

Methods: The present cross-sectional study was performed on 200 clients undergoing infertility treatment, selected by the convenience sampling method, and completed the Copenhagen multi- centre psychological infertility-fertility problem scales (COMPI-FPSS). Descriptive and inferential statistics (the Kolmogorov-Smirnov, Mann-Whitney, Kruskal-Wallis, Chi-square, and t-tests, as well as the Spearman correlation coefficient, AVONA, and multiple linear regression) were used to analyze the data in SPSS version 16.

***Results*:** The results showed that the mean total score of infertility stress was 28.67±9.85 in the study subjects. The mean scores obtained in personal, marital, and social domains of COMPI-FPSS were 15.29±5.39, 7.43±3.72, and 5.95±2.47, respectively. A significant difference was observed in the stress score between males and females (P<0.001). There was a significant relationship between income adequacy (P=0.005), frequency of unsuccessful infertility treatment (P=0.001), duration of treatment (P=0.009), and infertility-related stress.

Conclusion: Infertile subjects experienced more stress in the personal domain compared to other domains. Stress scores were significantly associated with gender, financial status, frequency of unsuccessful infertility treatment, and the duration of treatment variables. Therefore, providing counseling services and psychosocial interventions infertility treatment clinics in order to meet the psychological needs of infertile clients is an undeniable necessity.

Keywords: infertility, infertile couples, stress, infertility-related stress

Introduction

Fertility and childbearing are major functions of the family in many societies and stand opposite to infertility, raised as a problem, along with its adverse social impacts on infertile couples, families, and even society [1]. Infertility defined by the failure to achieve a pregnancy after 12 months of regular unprotected sexual intercourse [2], classified into two primary and secondary types with different female, male, and unknown causes [3]. Today, more than 70 million couples worldwide deal with infertility, mostly from developed countries [4]. The prevalence of infertility in Western and developing countries is one per seven and four couples, respectively [5].

In Iran, according to the latest statistical estimates of the National Program, the prevalence of infertility is reported 20% [6]; the prevalence of

primary infertility is 20.17% on average, only 23.81% in Guilan Province (North of Iran) [7]. The World Health Organization (WHO) ranked infertility as the third most serious global disease of the 21st century after cancer and cardiovascular diseases [8].

Childbearing is an inherited need in humans, and since reproduction is believed as one of the basic needs when a problem arises, it creates psychological crises in the affected individuals [9]. The consequences of infertility in developing countries are far greater than those in developed Western ones [4]. In Iranian culture, patriarchal beliefs about the survival of generation, lack of socioeconomic support for many females, low chances of remarriage, and also a condemnation of single life are among the factors intensifying infertility suffering for females [10]. In fact, the infertility crisis is a difficult emotional experience affecting different aspects of personal and marital life, such as social relationships, goal, quality of life, and sexuality [2], which leads to negative emotions, such as anxiety, depression, grief, stress, social withdrawal, lack of self-confidence, and helplessness [8].

The results of an analytical study showed that infertility has a negative effect on marital life and other psychological aspects of couples, including marital commitment and relationship quality, and makes their lives more challenging [11]. In other words, infertility is a painful emotional experience associated with stress [12]. Psychological stress is often considered a natural outcome of infertility, emerges acutely or chronically in infertile individuals [13]. The results of a cross-sectional study showed that despite the unprecedented COVID-19 pandemic, causing socioeconomic uncertainty, infertility-related stress is still drastic, comparable to that caused by the Coronavirus pandemic [14].

Despite years of research, the relationship between stress and infertility remains unclear [15]. It seems that infertility-related stress can lead totreatmentinterruption and cause frustration and low self-esteem in the affected couples or make infertility treatments ineffective [12]. A prospective cohort study showed that higher levels of salivary alpha-amylase could be utilized as an objective predictor of high infertility-related stress, increasing the risk of reproductive failure in those undergoing IVF embryo transfer [16].

Given the unpredictable and variable nature of the in fertility phenomenon, acceptance and adaptation to it are difficult [3], and levels of adaptation vary across couples under the influence of personal, relationships, and social factors [17]. Even if males and females are emotionally affected by infertility, studies show that females are more prone to stress [18]. The results of a cross-sectional study show edthat females with infertility were more stressed than males [19], and another cross-sectional research highlighted that even when male infertility was the cause, diagnostic and therapeutic procedures often impose a heavy burden on females, and they experience more worries compared to their husbands [20]. Furthermore, the psychological problems of infertile couples are related to age, occupational status, level of education, and duration of infertility [21]. Also, duration of marriage, number of previous cycles, infertility diagnosis, and treatment costs are the factors affecting their anxiety, as well as personal, social, and marital distress [22]. A cross-sectional study reported a lower economic status and level of education among the risk factors of stress, anxiety, and depression in infertile couples [23], and another study reported that psychological disorders are associated with aging, higher education, prolonged infertility, and unemployment in infertile couples [21].

Since the mental health of infertile couples may affect treatment stages and outcome, unsuccessful treatment, along with negligence of mental disorders, can lead to a cycle of the above factors. In contrast, control of each can trigger the treatment of the other [23]; in other words, physical treatment is not enough, and meeting their psychological needs is essential for successful treatment [12]. Therefore, receiving more information about the factors affecting the mental health of infertile couples can help treat infertility and improve their mental health [23]. Accordingly, the present study aimed at determining the infertility-related stress and related factors in infertile couples referred to the infertility clinic of Al-Zahra hospital in Rasht, Iran, in 2019.

Methods

The present analytical, cross-sectional study was performed on infertile clients referred to the

infertility clinic of Al-Zahra hospital in Rasht, Iran, in 2019. If couples attended the clinic together, sampling was perfumed on both of them separately, and if only one presented, the questionnaire was completed by him/her alone. Based on the results of the study by Aflakseir and Zareh [24], with a personal stress standard deviation (SD) of 3.09 and an acceptable error of 0.45, the sample size was determined 181, which increased to 200 considering a 10% probability of dropouts.

A convenience sampling was performed consecutively from December 2019 to January 2020 in the study setting. Inclusion criteria were: voluntary participation, confirmed infertility diagnosis by gynecologists and recorded in the medical file, no children, no previous or current history of chronic physical and debilitating illnesses or neurological and mental disorders (based on self-reporting or medical file), being able to understand the Persian language, and literacy. The exclusion criterion was incomplete questionnaires (lack of answering more than 10% of items).

The instruments used for data collection were a sociodemographic and fertility information questionnaire, including items on age, gender, level of education, place of residence, occupational status, financial status, type of treatment received, frequency of unsuccessful fertility treatment, cause of infertility, duration of marriage, and duration of treatment, and the Copenhagen Multi-Centre psychological infertility fertility problem scales(COMPI-FPSS). This 14-item questionnaire was designed and psychometrically assessed by Schmidt [25]; six items are on personal, four on marital, and four on social domains. Items 1 and 2 in the personal and marital domains are scored based on a five-option Likert scale (1=strongly disagree, 2=somewhat disagree, 3=neither disagree nor agree, 4=somewhat agree, and 5=strongly agree) and the rest based on a four-option Likert scale (1=none, 2=a little, 3=somewhat, and 4=a lot). The total score of the questionnaire ranges from14 to 60, 6-26 in the personal domain, 4-18 in the marital domain, and 4-16 in the social domain. A higher score indicates more stress [26].

After obtaining permission from the designer of COMPI-FPSS, the original questionnaire was translated from English to Persian using the forward-backward method and based on the model suggested by Wild et al. [27]. The translated version was sent to 13 faculty members of Guilan University of Medical Sciences, Rasht, Iran, in midwifery, reproductive health, gynecology and infertility, and psychiatry, and the content validity ratio (CVR) and content validity index (CVI) were calculated. Items with CVI <0.79 and CVR<0.54 were removed from the questionnaire [28]. According to experts, CVR for items was 0.84-1, and CVI for 14 items of the questionnaire was 0.92-1. The scale CVI average (S-CVI/Ave) was 0.98, so no items were deleted. Two methods of internal consistency and stability were used to assess the reliability. For this purpose, the questionnaire was completed by 30 eligible couples, and the internal consistency was 0.89 by Cronbach's alpha. The stability was calculated by test-retest with a two-week interval, and the intraclass correlation coefficient (ICC) was 0.93.

To collect data in the present study, with an introduction letter from the Vice-Chancellor for Research and Technology of Guilan University of Medical Sciences, the author attended the infertility clinic of Al-Zahra hospital in Rasht. The study objectives were explained to eligible couples, and after obtaining informed consent, they were asked to complete the questionnaire.

Regarding ethical considerations, oral and written informed consent were obtained from the respondents. Maximum confidentiality was maintained in keeping personal information during the study, and questionnaires were completed anonymously. The present article is extracted from part of the master's thesis by the author, approved by the Ethics Committee of Guilan University of Medical Sciences (ethical code: IR.GUMS.REC.1398.101). To analyze data, descriptive (absolute and relative frequency, mean and standard deviation) and inferential statistics (the Kolmogorov-Smirnov, Spearman correlation coefficient, Mann-Whitney, Kruskal-Wallis, Chi-square, and t-tests, as well as ANOVA and multiple linear regression) were used in the SPSS version 16. The level of significance was <0.05 in all tests.

Results

The mean age of female and male respondents were 32.95± 6.72 and 35.39± 7.26 years,

respectively; the majority were females (84.5%). More than one-third ofparticipatedfemales (31.4%) and the majority of males (42%) belonged to the age group of 30-34 years. The majority of females (39%) had a university degree and the majority of males (39%) a diploma. The majority of females (82%) were housewives, and the majority of males (53%) self-employed. The majority of couples (71%) were urban residents. The majority of infertile couples (59.5%) had insufficient income. The duration of marriage was less than 10 years in most couples (80.5%). Infertility in the majority of couples (46.5%) had a female issue; the majority of them (38.5%) were on treatment with assisted reproductive techniques (IVF, ICSI, Oocytes transfer, and embryo transfer). The majority of infertile couples (51.7%) were on fertility treatment for less than two years. The majority of participants (50.3%) had a history of one or two unsuccessful infertility treatment cycles. The participants' characteristics are shown in Table 1.

Table 1: Frequency Distribution of Participants Based on sociodemographic and fertility characteristics

Variables	Variable Features	Frequency	Percentage
Males age group, year	Mean±SD: 32.5±6.53		
Females age group, year	Mean±SD: 35.3±7.26		
Gender	Female	169	84.5
	Male	31	15.5
Females level of education	Under high school diploma	47	32.5
	High school diploma	75	37.5
	Academic degree	78	39
Males level of education	Under high school diploma	62	31
	High school diploma	78	39
	Academic degree	60	30
Place of residence	Urban	142	71
	Rural	58	29
Financial status	Sufficient	81	40.5
	Insufficient	119	59.5
The type of treatment received	IUI	58	29
	IVF	29	14.5
	Microinjection	34	17
	Oocytestransfer	2	1
	Embryo transfer	12	6
	Others	65	32.5
Females number of failed treatment cycles	0	34	20.1
	1	63	37.3
	2	22	13
	>2	50	29.6
Males number of failed treatment cycles	0	6	19.4
	1	9	29
	2	2	6.5
	>2	14	45.2
Females years of marriage	Mean±SD: 21.50±4.6		
Males year of marriage	Mean±SD: 24.42±4.6		
Cause of infertility	Female	93	46.5
	Male	30	15
	Both male and female issues	31	15.5
	Unknown	46	23
Female duration of treatment, mn	Mean±SD: 42.12±27.28		
Male duration of treatment, mn	Mean±SD: 22.13±26.29		

The mean total score of infertility-related stress was 28.67±9.85in the respondents. Also, the mean scores obtained in the personal, marital, and social domains of COMPI-FPSS were 15.29±5.39, 7.43±3.72, and 5.95±2.47, respectively, indicating infertile individuals experience more stress in the personaldomaincompared to other domains. In the present study, the Kolmogorov-Smirnov test was

used to assess the normality of the total score of stress and subscales, showing the non-normality of variables. There was no significant relationship between infertility-related stress and some socio-personal and fertility variables, such as age, place of residence, level of education, occupational status, type of treatment received, and duration of marriage. The relationship between the overall stress score and each of the personal, marital, and social domains of COMPI-FPSS, and other socio-personal and fertility variables of participating couples is shown in Table 2.In a stepwise multiple linear regression model with total stress score, as a response or dependent variable, and the study variables, as independent variables, the relationship between the variables and the stress score was obtained after fitting the stepwise regression model (Table 3).

Table 2: Correlation of total stress score and subscales scores with sociodemographic and fertility variables related to infertility-related stress in the participants

Infertility-related StressScore / Variable	Total Infertility-related stress	Personal Domain	Marital Domain	Social Domain
Gender	Median: 29.00 P<0.001 U*=-3.98	Median: 16.00 P<0.001 U*= -4.55	Median: 6.00 P<0.05 U*= -2.08	Median: 5.00 P<0.05 U*= -2.15
Income	Median: 29.00 P=0.005 U*=-2.80	Mean: 16/10 **t=-2.62 ***df=198 P<0.05	Median: 7.00 P<0.05 U*= -2.26	Median: 5.00 P=0.062 U*=-2.80
Number of failed treatment cycles	****df=3 P=0.001 Median:34.00	*****df =3 F=6.07 P=0.001 Mean:16.75	****df=3 P=0.05 Median:8.50	****df=3 P=0.05 Median:5.50
Duration of treatment	******P=0.009	******P=0.001	-	-

The Man-Whitney statistic, **t-test statistic, ***degree of freedom, * the Kruskal-Wallis test degree of freedom, *****ANOVA degree of freedom, F ANONA statistic, ******the test used: the Spearman correlation coefficient**

According to Table 2, a significant difference was observed in the stress score between males and females. There was also a significant relationship between family income adequacy and total stress score and personal and marital domains scores so that infertility-related stress was significantly higher in respondents with insufficient income than those with sufficient income. There was a significant relationship between the frequency of unsuccessful fertility treatment and the total stress score and the personal domainscore. Also, a significant relationship was observed between total stress score and personal domain score, and the duration of treatment. In fact, stress increases with prolonged treatment.

Table 3: Stepwise multiple linear regression analysis of predictors of infertility-related stress (N=200)

Independent Variable	Unstandardized coefficient, (β)	Standard Error, (SE)	T (t-test)	P value	95%CI
Gender	8.10	1.76	4.59	<0.001	4.62-11.58
Age, yr	0.19	0.09	1.98	0.05	0.00-0.38
Financial status	3.88	1.29	3.02	0.003	1.34-6.42
Number of failed treatment cycles	0.65	1.78	0.37	0.714	-2.86-4.17
	5.15	1.99	2.58	<0.05	1.21-9.09
	6.56	1.40	4.70	<0.001	3.81-9.31
	0.03	0.03	1.20	0.233	-0.02-0.08

B=Unstandardaizes Coefficient, SE: Standard Error, T=t-test

According to Table 3, if other variables are constant, the mean stress score of females was higher than that of males by 8.10. The mean stress score of infertile individuals with insufficient income was higher than their counterparts with sufficient income by 3.88. The mean stress score of infertile individuals with a history of more than twice treatment cycle failures was higher than those with a history of less often unsuccessful treatments by 6.56. The mean stress score of infertile individuals with a history of twice treatment cycle failures was higher than others by 5.15.

Discussion

The present study aimedat determining infertility-related stress and its associated factors in infertile clients. In the study, the mean total score of infertility-related stress was 28.67±9.85 in the participants, and the mean score obtained in the personal, marital, and social domains were 15.29±5.39, 7.43±3.72, and 5.95±2.47, respectively. Accordingly, infertile individuals experienced more stress in the personal domain compared to other domains. In the study by Cesta et al. [29], the total score of infertility-related stress was OR=1.18 (95%CI: 0.56-2.47), and in the study by Swift [30], the score of infertility stress was 53 in the personal domain, 22 in the marital domain, and 13 in the social domain, and since infertile individuals experienced more stress in the personaldomaincompared to other domains, the results of his study were consistent with those of the present study. The present study results were also consistent with the findings of Schmidt [25], Martins et al. [31], and Yilmaz et al. [32].

In the present study, no significant relationship was found between the reported stress and place of residence, age, occupational status, and education level in the respondents. In the study by Karimzadeh et al. [21], a significant relationship was observed between the couple's psychological problems and age, occupational status, and level of education, so that higher level of education in males was associated with anxiety and depression; the condition even worsened in females with an increase in age and duration of infertility. In the study by Abdishahshahani et al. [23], stress, anxiety, and depression had a significant relationship with the level of education, and in the study Hanna and Gough [33], the results indicated that the financial burden of infertility could significantly affect work life in males, which were inconsistent with the present study findings. According to the author, the higher number of housewives, the higher number of females compared to males, differences in the study settings, sampling methods, and socio-cultural characteristics could explain differences among the results of the present and above studies.

The findings of the present study indicated that the type of fertility treatment could not predict the level of infertility-related stress in the affected couples that was inconsistent with those of the studies by Gamel et al. [9] and Dadfar et al. [34]. Besides, in the present study, no significant relationships were observed between the duration of marriage and level of stress in couples, while findings of the study by Yilmaz et al. [35], indicating that the level of infertility-related anxiety increased with increased years of marriage, prolonged child wish, and increased treatment duration. According to the researcher,

methodological differences, type of study, non-random selection of subjects, differences in research tools, and cultural variations can affect the obtained results.

The WHO believes that both males and females experience significant psychological distress in the face of infertility crises due to low self-esteem, isolation, loss of control, sexual dysfunction, and depression [29]. In the present study, the mean score of infertility-related stress was significantly higher in females than males by 8.10. These findings were consistent with those of a study by Abdishahshahani et al. [23], showing that the level of stress in females was higher than that of males (14 (66%) vs. 9 (51.8%). In addition, the study by Karimzadeh et al. [21], showed that regardless of the cause of infertility, females are more vulnerable to psychological disorders associated with infertility, and the inability to bear a child always threatens them. They are blamed and consider responsible for infertility, even if infertility has no female issues. The results may be due to socio-cultural requirements of Iranian society as females considering childbearing a factor of marital bond and family foundation establishment. They believe that infertility is a serious threat to their marriage and are under more stress consequently. Findings of the study by Nagorska et al. [36], showed that females talk more openly about infertility with others, while males were more restrained and preferred to only talk to their partners. Grief was the most common reaction of females to pregnancy in social environments around them, while helplessness was the most common reaction of males. Males were more ready to accept childlessness than females, and most believed in the success of treatment. Therefore, in the approach to infertility, gender differences should be considered in evaluating diagnosis and treatment. The study by Mirzaei-Moghadam et al. [1], showed that gender differences have a drastic effect on stress perceived by infertile couples. Contrary to the present study results, they showed that the level of perceived stress in males was higher than in females. Also, the study by Gamel et al. [9], indicated that infertility causes many psychological problems for males, and psychological status of males is affected by personal and social factors, such as the type and duration of fertility treatment. But in the study by Dadfar et al. [34], no significant differences were observed in the number and intensity of stressors between genders.

In the present study, the duration of treatment was another factor affecting the level of stress in infertile couples. The findings were consistent with those of Gamel et al. [9], and Nagorska et al. [36]. Nagorska et al. [36], showed that the greatest suffering of males during fertility treatment was the prolonged course and embarrassing tests. Contrary to these findings, the study by Dadfar et al. [34], highlighted that the duration of infertility had no significant correlations with the number and intensity of stressors.

A significant relationship was observed in the present study between stress and the income level of couples. It is quite clear that investing in therapeutic cycles affects finances and places couples at risk of debt. The findings were consistent with those of Abdishahshahani et al. [23], showing that stress, anxiety, and depression had a significant relationship with economic status in couples. In the study by Hanna and Gough, males described infertility as a threat to their financial security and economic welfare, and according to the results reported by Curtis [37], fertility treatment was one of the most common and frustrating processes in the United States, which are not available to a large population of such individuals due to various barriers, such as high costs, insurance requirements, and social regulations. The study by Jafarzadeh-Kenarsari et al. [38], reported that the huge costs of infertility diagnosis and treatment, the long and repetitive nature of these processes, and financial constraints were among the most important concerns of patients, and most participants highlighted exorbitant costs and financial problems as reasons for delays in starting or even stopping treatment.

Based on the findings of the present study, the frequency of unsuccessful fertility treatment, as a variable, had a significant relationship with stress in infertile couples. Understanding how infertile individuals and couples deal with the problem and their coping strategies against unsuccessful treatments is of great importance due to its consequences for the welfare [39]. The results of a study by Chehreh et al. [19] suggested that

infertility-related stress is higher in females than males due to unsuccessful fertility treatment. The results of the study by Hajiyan et al. [40], showed that infertile females with a history of unsuccessful treatment with assisted reproductive technology (ART) had high infertility-related stress and a moderate level of accepting a child adoption. Explaining these findings, it can be said that infertile people generally have unrealistic expectations of fertility treatments at the beginning of the procedure, and many of them believe that doctors do not inform them about the chances of success until the end of the process; they may even minimize the importance of such information considering their interest in becoming a parent. Many patients found childlessness difficult even after treatment cessation. Given the strong goal of playing a role as a parent, examining how infertile individuals and couples evaluate the experience of a failed treatment cycle and decide on treatment continuation is of great importance. The results of the study by Silva [39] showed that after treatment failure, people use several coping methods, including the experience of treatment failure as a learning tool and emphasizing the importance of persistence in achieving success.

Conclusion

Infertile clients experienced more stress in the personaldomaincompared to other domains and the stress score was significantly associated with variables of gender, financial status, frequency of unsuccessful treatment, and duration of treatment. Therefore, providing counseling services and psychosocial interventions to meet the psychological needs of infertile clients in infertility treatment centers is an undeniable necessity.

The limitations of the present study were: non-random sampling, a single-center design, and enrolling only infertile couples seeking treatment. Therefore, more cautions should be taken in generalizing the present study results. It is suggested to conduct similar studies in other parts of Iran considering all the above-mentioned issues.

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Conflict of interest

The authors declared no conflicts of interest.

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