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Website: www.jehp.net
DOI: 10.4103/jehp.jehp_412_19

Investigating related factors to psychological symptoms of infertile couples undergoing assisted reproductive treatment

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Abstract:

BACKGROUND: The impact of infertility and assisted reproductive treatment on the mental health of infertile couples is documented, and the identification of its predictor factors can be helpful in identifying susceptible individuals. Therefore, the aim of this study was to identify the factors associated with psychological symptoms of infertile couples undergoing assisted reproductive treatment.

MATERIALS AND METHODS: Using convenience sampling method, this cross-sectional study was conducted on 212 couples undergoing assisted reproductive treatments. The levels of mental disorders (depression, anxiety, and stress) of the couples undergoing assisted reproductive treatments were assessed via self-report questionnaire of Depression, Anxiety, and Stress Scales. Data analysis was performed using paired *t*-test, independent *t*-test, Wilcoxon signed-rank test, Pearson correlation coefficient, Spearman correlation, and multivariate linear regression.

RESULTS: The mean scores of stress, anxiety, and depression in women (14, 9.93, and 10.7) were significantly higher than that in men (9, 5.51, and 6.6). Correlation coefficient of stress, anxiety, and depression scores in women was inversely correlated with their age. Moreover, stress, anxiety, and depression scores in men were significantly correlated with the duration of infertility. In both men and women, stress, anxiety, and depression scores were inversely correlated with the level of education and economic situation.

CONCLUSION: The results showed that during assisted reproductive treatment, women are more likely to experience psychological problems than their spouses. In addition, underlying factors such as age, duration of infertility, and educational level do not similarly cause of lower mental health in men and women.

Keywords:

Anxiety, assisted reproductive treatment, depression, infertility, psychological health, stress

Introduction

Infertility, defined as nonachievement of pregnancy within 1 year of having regular unprotected intercourse,^[1] with 7.4% prevalence in the world,^[2] is not a mere medical problem as it affects all aspects of the couples' health including mental and social health.^[3] It is estimated that 21% of couples experience periods of infertility throughout their lives.^[2] As such, it is

considered worldwide as a public health problem.^[4]

Although significant advances have been made in the field of infertility treatment and assisted reproductive techniques since the middle second half of the 20th century, assisted reproductive treatment is costly and time-consuming.^[5] Accordingly, as a difficult process, it can make a significant change in the mental state of the people.^[6] Regardless of the problems associated with

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How to cite this article: Abdishahshahani M, Torabi M, Kazemi A. Investigating related factors to psychological symptoms of infertile couples undergoing assisted reproductive treatment. *J Edu Health Promot* 2020;9:21.

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Received: 24-07-2019

Accepted: 24-11-2019

the treatment of infertility through using assisted reproductive techniques, in many cases, failure of treatment is itself an uncontrollable crisis for infertile couples.^[7] Several treatment-related failures in some people and the possibility of failure in other therapeutic techniques can reduce the self-esteem of individuals.^[8] For these reasons, infertility is considered one of the marital crises, which can endanger the mental health of couples and lead to the increased incidence of depression and anxiety in infertile couples. A meta-analysis study showed that not only the prevalence of depression in infertile couples is high but has also been increasing over the years so that its prevalence has been 44% between 2000 and 2005 and 50% between 2006 and 2011.^[9]

In another study, the prevalence of anxiety and depression in infertile couples was estimated to be 49.6% and 33%,^[10] respectively. Although women's share of mental disorders is more than men,^[11] severe depression of infertility is associated with an increase of depression in the spouse. In addition, the stress of both men and women has effect on the stress, anxiety, and depression of the spouses.^[12,13] In a study, it has been shown that women who have experienced pregnancy after infertility treatment have less anxiety and depression than women who have not experienced it. Moreover, women with less anxiety got a better result^[14,15] that can be due to the influence of various factors. Studies have shown that the duration of infertility has a direct relationship and income has a negative relationship with the level of depression. On the other hand, age, duration of infertility, number of previous cycles of treatment, and treatment costs are directly related to anxiety level. Infertile homemakers, more than employed infertile women, are likely to develop progressive mental illness.^[16-18]

Since mental health of the infertile couples may affect the stages and outcome of the treatment, failure to achieve the desired outcome during treatment together with the lack of attention to mental disorders in couples can result in a cycle of the above-mentioned factors and lead to the exacerbation of the adverse effects. By contrast, controlling each one can help improve the other one. Therefore, knowing more about the factors affecting the mental health of this group of people can be helpful in treating infertility and mental health of these people. The aim of this study was to investigate the factors associated with psychological symptoms of infertile couples undergoing assisted reproductive treatment.

Materials and Methods

This cross-sectional study was conducted in Isfahan, Iran, on 212 couples undergoing assisted reproductive treatment in the Isfahan Infertility Clinic from January

2018 to May 2018 with the approval of the Ethics Committee of Isfahan University of Medical Sciences.

Assisted reproductive treatments include *in vitro* fertilization and intracytoplasmic sperm injection. Inclusion criteria: Using own gametes, the absence of simultaneous stressful crises, and the absence of any systemic disease based on health records. The sample size was calculated based on the confidence level of 95% (1.96) and the power factor test of 80%. Convenience sampling method was used in such a way that all eligible couples referred to the mentioned clinic had a chance to enter the study. The samples were selected from the couples who referred to the clinic for receiving ovarian follicle-stimulating drugs. The study goal was explained, and informed written consent was obtained from all eligible individuals. The background information of the couples was recorded based on the couples' medical records. Then, the level of mental disorders (depression, anxiety, and stress) was assessed individually for each of the couples using the standard self-report questionnaire of Depression, Anxiety, and Stress Scales (DASS-42). This questionnaire in Iran has been validated by Habibi *et al.* for Iranian society.^[19]

Data analysis was performed using web-based SPSS 19 software (Chicago, USA: IBM). Statistical tests such as paired *t*-test, independent *t*-test, Wilcoxon signed-rank test, Pearson correlation coefficient, Spearman correlation, and multivariate linear regression were used. The significance level was less than 0.05.

Results

Data analysis was performed on 212 couples whose participation was 100%. The age range for the women participated in the study was between 19 and 48 years and for the men between 26 and 56 years. The education level of most couples was high school diploma. The age and education level of the couples are compared in Table 1. The frequency of the couples with primary infertility (59.4%) was more than those with secondary

Table 1: Comparison of mean age and education level and psychological symptoms in couples

Variables	Mean (SD) or n (%)		Significant
	Women	Men	
Age	32.2 (4.8)	36.6 (5.0)	<0.001
Education (%)			
Less than high school	23 (11.3)	30 (14.1)	<0.001
High school	157 (74.1)	161 (76.0)	
University degree	31 (14.6)	21 (9.9)	
Psychological symptoms scores			
Stress	14 (1.6)	9 (8.51)	<0.001
Anxiety	9.9 (9.5)	5.5 (6.6)	<0.001
Depression	10.7 (1.5)	6.6 (7.7)	<0.001

SD=Standard deviation

infertility (40.6%). Moreover, the most frequent causes of infertility were both female and male factors (41%). Most of the participants (66%) declared that they have an average economic status. Among women, 169 were homemakers (79.7%) and 43 other women were employed (20.2%); the highest frequency of jobs among men was self-employment (49.1%). The results of Wilcoxon signed-rank test showed that the educational level of women was significantly higher than their spouses. In addition, the mean scores of stress, anxiety, and depression in women were significantly higher than that in men [Table 1].

Correlation coefficient of the scores of stress, anxiety, and depression in women was inversely correlated with their age. Moreover, the scores of stress, anxiety, and depression in men were significantly correlated with the duration of infertility. The scores of stress and anxiety and depression in women and men were correlated with education level and economic status [Table 2].

In addition, the results showed that the level of stress and anxiety in men had a reverse and significant relationship with the level of education. In women, the level of anxiety had a reverse and significant relationship with age. Furthermore, the level of stress, independent of the economic situation and age, was negatively related to male factor infertility. The level of depression

in them was related to both male and female factor negatively [Table 3].

Discussion

The aim of this study was to investigate the factors associated with the psychological symptoms of infertile couples undergoing assisted reproductive treatment. In the present study, the mean scores of stress, anxiety, and depression in women were significantly higher than that in men. In this regard, the results of the study by Maroufizadeh *et al.* showed that anxiety symptoms in women had been 2.26 times more than men; however, unlike the results of the present study, there was no significant relationship between depression level and gender.^[10] Nevertheless, in a review study conducted by Ying in 2015, it was shown that infertile women generally had higher levels of negative psychological symptoms such as stress, anxiety, and depression than men.^[20] Infertility stigma in women and social pressures caused by it in developing societies make women more vulnerable to psychological injuries than men.^[21] According to these social pressures, infertile women do not talk with their friends and family about their problem.^[22] The social stigma caused by infertility, which mainly targets women, explains the relationship between depression and infertility in Iran and other countries in Southeast Asia.

Table 2: Correlation coefficients of the scores of stress, anxiety, and depression with age, education level, duration of infertility, and economic status based on gender

Psychological Symptoms	Age		Education level		Duration of infertility		Economic status	
	r	P	r	P	r	P	r	P
Women								
Stress	-0.16	0.02	-0.15	0.02	0.03	0.59	-0.22	<0.001
Anxiety	-0.17	0.01	-0.16	0.02	0.06	0.33	-0.18	0.008
Depression	-0.14	0.04	-0.17	0.009	0.07	0.29	0.20	0.003
Men								
Stress	0.05	0.47	-0.26	<0.001	0.15	0.03	-0.26	<0.001
Anxiety	0.10	0.13	-0.23	<0.001	0.20	0.003	-0.27	<0.001
Depression	0.06	0.38	-0.23	<0.001	0.17	0.01	-0.24	<0.001

Table 3: Relationship between psychological disorders with age, infertility duration, education, economic status, and infertility cause based on gender (regression analysis)

	Women						Men					
	Stress		Anxiety		Depression		Stress		Anxiety		Depression	
	R^2_{adj}	F	R^2_{adj}	F	R^2_{adj}	F	R^2_{adj}	F	R^2_{adj}	F	R^2_{adj}	F
	0.07	3.28	0.04	2.52	0.07	3.43	0.06	3.21	0.07	3.37	0.06	2.93
	P=0.003		P=0.016		P=0.002		P=0.003		P=0.002		P=0.006	
	β	Significant	β	Significant	β	Significant	β	Significant	β	Significant	β	Significant
Age	-0.16	0.03	-0.18	0.02	-0.14	0.05	0.06	0.40	0.09	0.18	0.06	0.39
Duration of infertility	-0.01	0.97	0.04	0.55	0.02	0.78	0.05	0.48	0.10	0.16	0.07	0.32
Education	-0.13	0.009	-0.12	0.09	-0.15	0.04	-0.22	0.003	-0.22	0.01	-0.22	0.01
Economic status	-0.15	0.02	-0.11	0.09	-0.11	0.09	-0.11	0.11	-0.06	0.43	-0.08	0.26
Female factor	-0.10	0.15	-0.04	0.53	-0.15	0.03	0.02	0.73	0.07	0.34	0.01	0.089
Male factor	-0.16	0.03	-0.09	0.23	-0.17	0.02	0.02	0.078	0.01	0.89	0.01	0.85
Both	0.01	0.99	-0.02	0.077	0.01	0.97	0.06	0.36	0.09	0.19	0.07	0.32

Another finding of the research showed that the level of stress and anxiety of women was negatively correlated with their age. In this regard, Maroufizadeh *et al.* reported that in their population, individuals with a higher age had a lower anxiety level, but there was no significant relationship between the score of depression and age.^[15] However, contrary to the results of this study, the mentioned authors did not find any significant relationship between age and anxiety and depression.^[10] According to Lakatos *et al.*, there is a relationship between anxiety and age, and older infertile women are more depressed.^[23] Ogawa *et al.* stated that age is not correlated with depression, but it is positively correlated with anxiety.^[24] Ben Shlomo *et al.* concluded that in the early stages of treatment, older women are more easily adapted to infertility treatment. Although, over time and because of ineffective treatment, aging can be considered as a source of stress, the results of the present study indicated that infertile women, more than pregnant women, believed that assisted reproductive techniques could overcome the effects of age on infertility.^[25]

In their study of Chinese men, Yang *et al.* found out that although depression is more prevalent in people under 30 and anxiety in people over 40, age is not a specific risk factor for depression and anxiety in these individuals.^[26]

Another finding of the present research indicated that the duration of infertility in men did not predict the level of stress, anxiety, and depression. In line with this finding, Maroufizadeh *et al.* in 2015 found a relationship between infertility and depression.^[15] It has also been showed that more than 5 years of infertility can increase the likelihood of anxiety and depression symptoms.^[10] Omani-Samani *et al.* remarked that an increase in the duration of infertility can increase the chance of anxiety.^[27] Similarly, Yang *et al.* referred to the duration of infertility as a risk factor for psychological problems in infertile men.^[26] However, what influences the hope for the success of treatment is the age of couples that, as a stronger factor, can predict the success of treatment. The present study, like many other studies, could not find any relationship between the duration of infertility and psychological symptoms in men.^[24,28-30] However, there are reports suggesting that there is a relationship between the duration of infertility and depression in women.^[31]

Another finding of the research showed that the level of education in women did not have a significant relationship with the level of stress and anxiety, while their depression score was related to this variable. In men, the level of stress and anxiety was negatively correlated with the level of education. In a study conducted by Maroufizadeh *et al.*, individuals with a higher level of academic education gained a lower

depression score.^[15] Omani-Samani *et al.* asserted that people with a higher education level are less likely to develop anxiety symptoms.^[27] People with higher levels of education use more effective coping mechanisms which can improve their mental health.^[32,33]

Based on another finding of the present research, the level of stress, anxiety, and depression was inversely correlated with economic situation. In women, there was a significantly reverse relationship between economic situation and the level of stress. Yang *et al.* discovered that people with lower incomes are more likely to be depressed.^[26] Likewise, Omani-Samani *et al.* suggested that people with poorer economic and social conditions are more likely to be anxious.^[27] The cost and lack of access to common infertility treatments^[5] for people with poor economic conditions can change the use of assisted reproductive treatments into a difficult process, jeopardize the mental health of the infertile couples, and alter the mental status of the couples undergoing treatment significantly.^[6]

In the present research, the level of stress and depression in women had a reverse and significant correlation with male factor. When the infertility factor is exclusively feminine, women have a higher level of anxiety and stress before and after the treatment, that is probably because they feel guilty. Infertile women with a female factor, or simultaneous female and male factors, are more stressed than women with male factor alone.^[6]

Although this study shows the relationship between some factors and the psychological symptoms of infertile couples undergoing assisted reproductive treatment, in interpreting the results, convenience sampling is the limitations of the present study that needed to be considered.

Conclusion

The results showed that the women undergoing assisted reproductive treatment are, more than men, exposed to psychological injuries. Among the risk factors mentioned may be made of poor economic situation and education level. Therefore, in couples with these risk factors, counseling and psychological interventions may reduce psychological damage caused by infertility and assisted reproductive treatments.

Acknowledgments

We would like to thank Isfahan University of Medical Sciences for financial support (Grant number: 396703). All procedures performed in participants were in accordance with the ethical standards of the Isfahan University of Medical Sciences (IR.MUI.REC.1396.396703).

Financial support and sponsorship

Isfahan University of Medical Sciences (GN: 394313) supported the study.

Conflicts of interest

There are no conflicts of interest.

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