Research Paper: Effects of Infertility Stress, Psychological Symptoms, and Quality of Life on Predicting Success Rate of IVF/ICSI Treatment in Infertile Women

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ABSTRACT

Objective: In any society, attention to physical, mental, social, and cultural health status as well as spiritual interests and providing opportunities for realization of a dynamic and healthy life is considered as the guarantee for the community health in the coming years. One of the issues that troubles the mental health of some people is infertility. In this regard, this study aims to determine the effects of infertility stress, mental symptoms, and quality of life of infertile women on predicting success rate of intra-cytoplasmic sperm injection (ICSI) and in vitro fertilization (IVF) treatment.

Methods: The present study employs correlational methodology. The study population comprised all women referred to Royan Infertility Institute, Tehran, Iran. The study sampling was purposeful and included 79 infertile women. Assessment tools used in this study were as follows: depression anxiety and stress scale (DASS-s), brief symptom inventory (BSI), fertility quality of life questionnaire (FertiQol), Newton infertility stress questionnaire, and demographic questionnaire. For statistical analysis, we used test correlation coefficients of data, multiple regression analysis, and logistic regression.

Results: Nagelkerke squared correlation coefficient was equal to 0.253, i.e., the predictors of depression, anxiety, and stress, brief symptom, quality of life, infertility and infertility stress, all together can explain 25% of the variance of the dependent variable – success of ICSI / IVF treatment.

Conclusion: When couples are waiting for the result of their treatments, infertile women start mental rumination and experience a variety of negative emotional experiences. These negative responses which entail cognitive, emotional, and behavioral aspects of individual's psychological world, suppress the healing process and are underlying factors for physical vulnerability of infertile person against psychological pressures. Subsequently, this physical vulnerability influences outcomes of assisted reproductive technology.

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1. Introduction

One of the essential and always debated concepts in the complex human world is the concept of health. The primary aim of the scientists in the field of psychology and medicine is to maximize the sense of well-being of people. Changes in the pattern of diseases that reduced infectious and chronic diseases and increased longevity has led to increased attention to the health concept in the last decades (Breslow, 2006). The importance of health status is to the extent that experts in this field have mentioned the focus of the present century on improving healthcare status (Phillips, 2006).

In any society, attention to the physical, mental, social, and cultural health as well as spiritual interests and also providing the necessary setting for realization of a dynamic and healthy life is considered as the guarantee for the community health in the coming years (Karami and Pirasteh, 2001). One of the issues that troubles mental health of some groups of human society is infertility. Infertility is a stressful experience and medically, defined as the inability to conceive after a year of regular sexual intercourse without using contraceptive methods. Psychologically, infertility is a critical period that imposes intense stress to infertile couples as cited in Fahami, Hosseini Ghoochani, Ehsanpour, and Zargham, 2010). Approximately, 10% to 15% of couples around the world experience infertility. According to Vahidi, Aadalan, and Mohammad (2009), on average, 21% to 22% of women experience primary infertility during their married life. A figure which is far from the global average.

Preliminary investigation into the psychological aspects of infertility has been focused on individual psychopathology, especially in women (Leon, 2010). Because most infertility treatments have focused on medical and technical aspects of infertility problem, some of its emotional and social aspects such as psychological turmoil and stress-related problems in people with infertility (that affect individual response to treatment) have not been demonstrated yet. Although, research on the psychological aspects of infertility has been generally conducted slowly compared to medical studies, in recent decades, the quality and quantity of studies have been dramatically increased in psychological topics related to infertility. These topics include the effect of stress on infertility and its treatment, gender differences in response to treatment, and cross-cultural issues. Conflicts and psychological pain of infertility severely affect interpersonal relationship and intrapersonal world (Damant, 2003). Numerous longitudinal studies have shown that the stress is associated with infertility and has harmful effects on both physical and mental health. In fact, psychological test profile of women with chronic infertility is similar to psychological profile of patients with cancer, heart disease, high blood pressure, chronic pain, or HIV infection. Feelings of grief, anxiety, frustration, depression, anger, feeling of emptiness, magical thinking, and envy people who have children, are common reactions that emerge following the denial of parenthood (Apfel, & Keylor, 2002).

The results of Shakeri et al. study show that psychological problems in infertile women undergoing IVF treatment methods are more serious; because they put the patients in a vicious cycle. On the one hand, the psychological problems lower patients' physical performance and their response to infertility medical therapy and on the other hand, the continuation of infertility and possible failures in the treatment process increase psychological problems of the patients. As a result, facilities should be provided to these individuals so that they can benefit from medical treatments of infertility as well as psychiatric treatments or in infertility treatment centers in addition to infertility treatment experts (urologist, gynecologist, and infertility expert) and embryologist, psychiatrists and psychologists must also be involved in the medical team (Shakeri, Hossieni, Golshani, Sadeghi, & Fizollahy, 2006). Research has shown that mental experiences of infertile women besides changes in their psychological status are predictors of their responses to infertility treatment. Ebbesen et al. (2009) indicated that the stress experienced by infertile women was related to the number of oocytes obtained during the treatment of infertility and as a result would affect the outcome of IVF treatment.

Another variable that may affect infertility results is the "quality of life." The results of Upkong and Orji (2006) study suggest that the prevalence of mental health problems in infertile couples, especially in women, is significant and obviously affects their quality of life. This is an important component of a problem that infertile couples are facing.

Regarding the extensive psychopathological symptoms and adverse mental status of infertile women, identifying psychosocial factors that affect infertility treatment outcomes can be helpful in adapting these vulnerable people to the problems they experience in dealing with their infertility. Therefore, the necessity of investigating the psychological factors in infertile patients is of great importance. With regard to the possible role of these variables in infertility treatment and their association with underlying health problems, conducting studies like the present one is important in identifying the influence of variables such as the quality of life, in-

fertility stress, and determining the interventions, which improve these variables.

2. Methods

The research question is to what extent such factors as infertility stress, severity of psychiatric symptoms, and quality of life can affect the success rates for IVF/ICSI.

To answer this question, logistic regression analysis has been employed for its adaptability and appropriateness. In doing so, the study focuses on whether psychological variables provide the success rates for such criterion variables as IVF/ICSI. Moreover, the study examines the variables that have more impact on criterion variables (i.e. IVF/ICSI). To benefit from the IVF/ICSI treatments, psychological symptoms such as stress variables, depression, overall symptom severity index, positive symptom distress index, interpersonal sensitivity, and obsessive-compulsive disorder are measured utilizing regression equation. The results are listed as follows.

3. Results

Table 1 presents the overall statistical significance of the model. As indicated in the significance level is less than 0.05 and, therefore, it can support the fact the model is significant. As such, the variables of stress, depression, overall severity index, positive symptom distress index, interpersonal sensitivity, and obsessive-compulsive disorder predict this likelihood that the IVF / ICSI treatments will be successful. To be more precise, Hosmer-Lemeshow test

was employed to determine both the model`s level of significance together with its level of fitness. Table 2 presents the results of the abovementioned test.

As listed in Table 2, although significance level is more than 0.05 and the Hosmer-Lemeshow test is not significant for the model, it has the potential to predict the results. In fact, higher level of significance increases the goodness of fit model for predicting the results. In this study (owing to the fact that the value of Chi-square in Hosmer-Lemeshow model is less than the value it has in monolithic testing model), this lack of significance indicates the goodness of fit model. Table 3 presents relevant results concerning the variance of the dependent variable.

As observed in Table 3, the squared Nagelkirk correlation coefficient equals 0.505, meaning that such psychological predicator variables as quality of life together with infertility stress can support 50.5% variance of the dependent variable concerning the success rates of IVF / ICSI treatments. To be more specific about these predicator variables, each predicator variable was measured and the findings are listed in Table 4.

Considering coefficients as well as the level of significance of the Wald test in Table 4, the predicator variable of obsessive-compulsive disorder, alone, can predict the success rates for IVF/ICSI treatments. On the other hand, other predicator variables do not provide significant results in the Wald test; moreover, they cannot predict the dependent variable in the model. It should be noted, however, that overall symptom severity index in conjunction with interpersonal sensitivity report high beta

Table 1. Monolithic testing of the model coefficients.

The First Step	Chi-square	df	Sig.
Model	23.431	8	0.003

Table 2. Hosmer-Lemeshow test.

The First Step	Chi-square	df	Sig.
Model	11.672	8	0.166

Table 3. The model summery.

The First Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkirk R Square
	32.603a	0.257	0.505

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Table 4. Predicator variables.

Predicator variables	B	S.E.	Wald	df	Sig.	Exp(B)
Stress	0.009	0.080	.014	1	0.907	1.009
Depression	0.097	0.073	1.763	1	0.184	1.102
Overall symptom severity index	-0.354	0.243	2.114	1	0.146	0.702
Positive symptom distress index	-0.066	0.073	0.818	1	0.366	0.936
Interpersonal sensitivity	-0.326	0.192	2.894	1	0.089	0.722
Obsessive-compulsive disorder	-0.641	0.280	5.250	1	0.022	0.527
Overall quality of life	-0.016	0.027	0.338	1	0.561	0.984
Infertility stress	-0.025	0.045	0.303	1	0.582	0.975

coefficients. Thus, except for the obsessive-compulsive disorder, the very variables of overall symptom severity index and interpersonal sensitivity can also predict success rates for IVF/ICSI treatments.

4. Discussion

This research measured the extent to which infertility stress, psychological symptoms, and infertile women`s quality of life would lead to success in IVF/ICSI treatments. Findings indicate that predictor variables such as psychological symptoms, infertile women`s quality of life, and infertility stress can explain 50% variance of the dependent variable concerning the success rates of IVF/ICSI treatments. The aforementioned result is in line with previous studies such as Chehreh et al. (2012), Vang and Lee (2004), and Compagne (2006), focusing on the correlation between psychological signs and symptoms, infertility, and infertility stress as well as supporting their findings regarding success rates of IVF/ICSI treatments. Likewise, Boivin and Schmidt (2005), in their longitudinal study, demonstrate that infertility stress predicts treatment outcomes up until a year after measurements.

Furthermore, the results of the study support those of Cousineau (2007), examining the impact of the psychological state of infertile couples regarding the outcomes of infertility treatment. Moreover, the findings confirm the assumptions held by De Klerk et al. (2008) and Smeenk et al. (2001) who reported that anxiety, depression, and stress might have a negative influence on the success rates of infertility treatments. Anderheim et al. (2005) have examined one of the negative impacts of stress on the outcome of assisted reproductive technology with regard to the process of disappointment that

occurs before experiencing the actual failure. While couples, in the course of treatment, tend to be notified in regard with the results of treatment, infertile women start to ruminate, thinking of various negative emotional responses, including cognitive, emotional, and behavioral aspects of the subject`s psychological world, play a critical role in lowering the subject`s adaptability to the treatment process, and leads to physical vulnerability of the infertile subject in the face of psychological pressures.

Subsequently, physical vulnerability affects the outcomes of assisted reproductive technology. Considering the high potential of obsessive-compulsive disorder in predicting the success rate for IVF/ICSI treatments, there is a possibility that subjects with obsessive-compulsive disorder seem to be more responsible about fetal health and safety. Accordingly, obsessive-compulsive disorder is associated with disturbing negative automatic thoughts and the lack of control causing a great deal of stress on infertile subjects. With respect to clinical observations, obsessive-compulsive disorder symptoms particularly those that obsessed with washing prevent infertile subjects from optimal cooperation with healthcare workers. This cooperation involves the beginning of IVF/ICSI treatments and postoperative care. It is important to note that the marital satisfaction for women suffering from obsessive-compulsive disorder is less than those who are not dealing with this disorder; further, severe stress in interpersonal relationships has a demoralizing effect on infertile subjects insofar as they no longer tend to pursue their infertility treatments.

In some cultures, infertility is considered as a hidden shame. In western culture, having no children is not that significant, and therefore, subjects do not hide their in-

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fertility from others. On the contrary, in Eastern culture or, to be more specific, in developing countries the concept of infertility is concerned with feeling of shame and infertility. In such conditions, subjects who suffer from obsessive-compulsive disorder are more likely to experience negative emotions and infertility could exacerbate such emotions. Save for obsessive-compulsive disorder, interpersonal sensitivity has a high potential for predicting the success rates for IVF/ICSI treatments. Infertile women with more interpersonal sensitivity have a very personalized interpretation of others` behaviors (i.e. the behaviors of their husbands as well as their families); in doing so, they experience feelings of inferiority, defect, and rejection more than others.

Intertwining families in Eastern countries adds to the reaction of infertile subjects` families and friends and the one who has already interpersonal sensitivity takes others` verbal or non-verbal behaviors as a kind of blame or innuendo (Shahrestani, Qanbari, Hashem Nemati, & Rahbardar, 2012). In comparison with Western culture, reproduction has a high value in Eastern culture, thus, impossibility of reproduction affects infertile subjects` social interactions (Wiersema, 2006). Extended families in Iranian culture marks the influence of both family and relatives on couple`s life; as such, infertility in such families might result in inappropriate interferences. Therefore, women who have more interpersonal sensitivities are more vulnerable, not to mention being worried about the end of their marital life which could be considered as the source of severe stress for infertile subjects. This issue was evident in the intervention group meeting and, in so doing, those who reported more complaints, and as IVF results indicate, they are more anxious in comparison with those who do not suffer from interpersonal sensitivity.

In sum, infertile women could experience such conditions as isolation, lack of interest in relationships of any kind, low self-esteem, inferiority, and worthlessness. Low self-esteem is associated with psychological symptoms such as anxiety, depression, and stress in infertile women, which lowers the possibility of success in IVF/ICSI treatments. On the other hand, there are findings that do not support the results of the present study. For instance, Linsten et al. (2009), in their study on infertile women experiencing IVF/ICSI treatments, indicated that psychological symptoms such as anxiety and depression have no significant role in predicting success rates for IVF/ICSI treatments. Moreover, they suggest that infertility stress cannot predict pregnancy rate in the final stages of IVF/ICSI treatments. The studies conducted by Anderheim et al. (2005) demonstrate that the success in assisted reproductive technology has no significant cor-

relation with anxious and depressed subjects for the only variable that can affect the success in assisted reproductive technology is the stress that has been experienced by the infertile subject during the treatment.

In their research, Symber et al. (2009) reported that there was no significant correlation between the level of anxiety and the result of assisted reproductive technology in the case of infertile women. These studies are found to have discrepancies in regard with sample size, different assessment tools for measuring psychological variables, and pregnancy criteria (considering clinical pregnancy). The results of this study show that psychological variables play a significant role regarding the results of infertility treatments; thus, it seems that focusing on difficulties in interpersonal relationships is associated with infertile subjects` adaptability. In other words, considering the subject`s psychopathology symptoms such as the symptoms of obsessive-compulsive disorder are of great importance before starting IVF/ICSI treatments. The aforementioned assumptions should be taken into account in developing related psychological interferences with this group for it elevates the success rates as well as the infertile subjects` mental health.

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Conflict of Interest

The authors declared no conflict of interests.

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