



# Comparison of the Effectiveness of Training based on Choice Theory and Pilates Exercises on Sexual Function and General Health of Infertile Women

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## Abstract

**Background and Objective:** The present study aimed to compare the effectiveness of training based on choice theory and Pilates exercises on sexual function and the general health of infertile women.

**Materials and Methods:** The present experimental study with a pre-test, post-test, and control group was conducted on infertile women referred to Kermanshah Obstetrics and Gynecology Hospital, Kermanshah, Iran in 2019-2020. 75 people are selected by non-random sampling method. Then the subjects were randomly divided into three groups choice theory, Pilates, and control. The Female Sexual Function Index (FSFI) by Ferguson and Augustine and General Health Questionnaire (GHQ-28) were used to measure the research variables. Data were analyzed using the analysis of covariance (ANCOVA).

**Results:** The results indicated that training based on choice theory and Pilates exercises has been significantly effective in increasing sexual function and general health of infertile women ( $p < 0.001$ ). A comparison of the obtained means shows that training based on choice theory greatly affects changes in sexual function and general health of infertile women than Pilates exercises ( $p < 0.001$ ).

**Conclusions:** According to the findings of the study, satisfaction with sexual function in women is significantly related to the level of general health due to infertility and psychological training promotes satisfaction with the relationship between couples.

**Keywords:** Choice-based training, General health, Infertile women, Pilates, Sexual function

## Background

Infertility, as one of the most common diseases of women, is a complex life crisis that is associated with physical, psychological, and social problems. Many authors have likened the psychological consequences of infertility to a response to public grief. Infertility is described as a failure in pregnancy after one year of regular and unprotected intercourse. Research shows that infertility affects 10-15% of couples of childbearing age [1].

One of the psychological characteristics of infertile women which can be affected by their conditions and problems is their sexual function. Poor communication in married life is one of the main causes of infertility; therefore, helping couples to improve their overall relationship and reduce sexual dysfunction which leads to resilience and health is part of their treatment. Sexual function is a part of human life and behavior which involves a combination of

different parts and requires coordination between the nervous, vascular, and endocrine systems. Negative physiological consequences following the diagnosis and treatment of infertility can affect the sexual function of couples and cause sexual dysfunction [3].

The general health of infertile women can be affected by their conditions and problems in addition to sexual function. The mental health of society depends on providing mental health of the family as a center of love and peace for flourishing talent. Health is recognized as a human right and social goal in the world and is vital to satisfy basic needs and improve the quality of human life [4]. Having a healthy life is the right of all human beings which depends on being aware of issues and categories that somewhat affect human health [5]. One of the important issues in discussing the health of individuals is considering their fertility

[6], Infertile couples also experience several psychological problems in the diagnosis, treatment, and course of the disease in addition to physical problems [7].

As mentioned, infertility can affect psychological characteristics of women such as Psychic restlessness, sexual function, and general health. Therefore, any factor or intervention which can affect the above-mentioned variables and improve them creates better conditions for the psychological state of infertile women and leads them to better deal with related issues. One type of intervention that can be effective in this field is training based on choice theory. Choice-based training is used to improve health and reduce sexual function. The choice theory was founded by Glasser in 1998 and emphasized the five basic human needs (survival, love and belonging, power, freedom, and entertainment) from which all human beings are motivated. Choice theory is simply defined as choices and how they are made and explains how humans behave to achieve what they want. This view holds that behavior at all times is the best effort to control the world as well as individuals as part of this world; therefore, one should always behave and choose the best way to meet the needs [8].

According to Glasser, one of the most important practical fruits of choice theory is making people responsible to the extent that it is also called an "invitation to responsibility". In the framework of choice theory, humans constantly choose their behaviors to meet their needs; therefore, they are responsible for their behaviors.

In addition to the above training method, the Pilates exercises can be used as an intervention to improve the psychological characteristics of infertile women such as Psychic restlessness, sexual function, and general health. Exercise as a treatment routine typically changes physical and mental health, sexual function, and Psychic restlessness. Although comprehensive studies are not available, to the best of our knowledge, few studies report that exercise greatly improves these subclinical disorders. Pilates significantly avoids high impact, high power output, and heavy muscular and skeletal loading. Studies demonstrate that 30 min of exercise a day improves sexual health and increases strength and improves heart function, resulting in better blood flow. A study found that 80% of men and 60% of women who participate in an exercise program at least 2-3 times a week have higher than average sexual desire. Regular exercise reduces the sexual age of individuals. In another study, the sex age of 60-year-olds who swam regularly was about two decades younger than their birth certificate. Another study

found that men over 50 who exercised regularly were 30% less likely to have impotence than their inactive peers. In addition, regular exercise releases large amounts of endorphins into the body which leads to greater sexual pleasure [9].

Infertility is a life crisis that can cause stress for couples by disrupting marital quality, reducing public health, feeling failure in the marital relationship, and increasing mental disorders. Numerous studies reveal that infertility is also associated with psycho-sexual dysfunction in a large number of couples [10]. Also, infertility causes significant psychological changes in individuals and severely affects the sexual relationship and function of couples. One of the most important common features between the two therapies is choice theory and Pilates exercises. Therapeutic commitment is self-improvement that improves the quality of life. Pilates significantly avoids high impact, high power output, and heavy muscular and skeletal loading.

### Objectives

The present study aimed to compare the effectiveness of training based on choice theory and Pilates exercises on sexual function and the general health of infertile women.

### Materials and Methods

The present quasi-experimental study with pre-test, post-test, and a control group (training based on choice theory and Pilates exercises). The present clinical trial was approved by the Ethics Committee of Islamic Azad University, Borujerd, Iran (IR.IAU.B.REC.1399.056).

The statistical population of this study included all infertile women referred to Kermanshah Obstetrics and Gynecology Hospital, Kermanshah, Iran in 2019-2020. In addition, 15 to 30 individuals are suggested for each experimental group in quasi-experimental studies. A total of 25 individuals were selected for each group using the available non-random sampling method due to the possibility of sample loss.

### Data Collection

#### The Female Sexual Function Index (FSFI)

This self-report questionnaire consists of 19 questions and measures 6 areas of female sexual performance conducted by Rosen, Human, LeBlam, Maston, Shabsugheh, Ferguson, and D. Augustine in 2000 [11]. Cronbach's alpha coefficient in Rosen (2000) for each domain and the whole scale was 0.70 or higher, which is consistent with the results of Maston (0.74 or higher) and Weigel (0.80 or higher). Rosen (2000) reported the reliability of the

retest for the scale as 0.88 and the subscales from 0.79 to 0.86. The internal reliability of the scale and subscales was calculated for all individuals over 70 by calculating Cronbach's alpha coefficient in the study of Mohammadi, Heidari, and Faghihzadeh (2008) [12]. The reliability of the retest for the scale was 0.84 and subscales from 0.71 to 0.82. A significant difference was observed between the mean scores of the whole scale and each of the domains in the case and control groups by examining the validity or reliability of the Persian version of the questionnaire ( $P \leq 0.001$ ). Scores obtained from the scale, subscales, and the diagnosis of the psychiatrist were analyzed using the Curve-ROC and the area under the curve. The appropriate cut-off score of the scale diagnosing sexual dysfunction was 28, according to which 83% of women with the disorder and 82% of them without that were correctly classified. The accuracy index of the scale and subscales in diagnosing sexual dysfunction was the area under the Curve-ROC and the highest sub-curve level was the scale ( $AUC = 0.971$ ) and then the area of sexual satisfaction ( $AUC = 0.873$ ).

#### General Health Questionnaire (GHQ-28)

It consists of 28 items. The questionnaire was designed by Goldberg (1972) and consists of 4 subscales, each of which are investigated by 7 items.

The items are rated by a 4-point Likert scale, resulting in a total score ranging from 0 to 84, and the cutoff point was considered to be 23, with a higher score indicating lower mental health.

The reliability of the entire questionnaire has been reported 0.91 and those of the subscales between 0.77 and 0.82 [13].

#### Training package based on choice theory

Choice theory-based training is defined based on Glasser treatment which is planned for 8 treatment sessions. In this study, the principles of the choice theory were designed with an emphasis on improving mental impatience, sexual function, and health. This program was implemented in the form of 8 sessions of 60 min once a week for two months (Table 1).

Pilates significantly avoids high impact, high power output, and heavy muscular and skeletal loading.

Ethical considerations included receiving written consent from the participants and informing them of the subject and method of implementation before starting the study. Also, the necessary instructions were provided to the participants to follow up in case of any disturbance. Participation

**Table 1.** Choice theory training protocol

	Content Outlines (Content Title)
<b>First Session</b>	Familiarizing class members with each other, stating the purpose of the class, and introducing the history of choice theory
<b>Second Session</b>	Introducing the five main needs for issuing behavior
<b>Third Session</b>	Introducing external and internal control and teaching ten principles of choice theory
<b>Fourth Session</b>	Familiarizing class members with the real world and the desired world, four components of general behavior, and introducing the behavior machine
<b>Fifth Session</b>	Explaining the necessity of balancing between desires and possessions, the correct method of self-assessment, and destructive behaviors
<b>Sixth Session</b>	Reviewing and linking the main concepts of choice theory, creating a realistic picture for goals, introducing goal characteristics, and planning to achieve the goals
<b>Seventh Session</b>	Clarifying the need for practical action toward goals, and familiarizing class members with the concept of self-regulation, self-management, and conscientiousness
<b>Eighth Session</b>	Explaining the importance of being responsible for personal, interpersonal, marital, and social relationships, summarizing and performing post-test

in the study caused no financial burden for the participants (Table 2).

Descriptive statistics such as frequency, percentage, mean, graph, standard deviation, and inferential statistics of multivariate analysis of covariance were used to analyze the data.

**Table 2.** Protocol of a Pilates exercises

	Content Outlines (Content Title)	Targets
<b>First Session</b>	Build strong muscles	Strengthen muscles
<b>Second Session</b>	Strengthen and stabilize the central muscles of the body	Strengthen the central muscles of the body
<b>Third Session</b>	Strengthen the pelvic floor muscles	Strengthen the pelvic floor muscles
<b>Fourth Session</b>	Improve body posture when sitting or standing	Improve posture when sitting or standing
<b>Fifth Session</b>	Reduce physical pain	Reduce physical pain, especially back pain
<b>Sixth Session</b>	Weight Loss	Lose weight
<b>Seventh Session</b>	Reduce stress	Reduce stress
<b>Eighth Session</b>	Reduce depression	Reduce depression
<b>Ninth Session</b>	Increase health	Increase health
<b>Tenth Session</b>	Post-test	Fill out the questionnaire

#### Results

According to Table 3, although the pre-test scores in the control and experimental groups are almost the same, the post-test scores of the experimental group have changed compared to that of the control group, and training has affected the variables and individuals have improved in those cases.

The results of examining the difference between the effectiveness of training based on choice theory and

**Table 3.** Mean and standard deviation of test variables by intervention and test group

Variable	Test	M	SD	
Choice Theory	General	Pre-test	42.4	6.1
	Health	Post-test	21.76	4.61
	Sexual	Pre-test	24.64	4.88
Pilates	Function	Post-test	51.32	4.41
	General	Pre-test	43.96	6.19
	Health	Post-test	23.04	5.05
Control Group	Sexual	Pre-test	17.76	3.26
	Function	Post-test	54.2	4.18
	General	Pre-test	42.72	9.01
Pilates	Health	Post-test	40.48	5.85
	Sexual	Pre-test	25.8	5.56
	Function	Post-test	26.08	5.33

Pilates exercises on the general health of infertile women concluded that changes in general health in pre-test and post-test in experimental and control groups are not the same with 95% confidence. A significant difference was also observed between the types of training performed on infertile women (Table 4). As Table 5 presents, the general health of the participants who received the training significantly increased compared to that of the control group. The results indicated that training based on choice theory has a greater impact on changes in infertility than Pilates exercises. The level of ETA also indicated that approximately 28.8% of general health changed under the influence of experimental groups.

**Table 4.** Results of analysis of covariance by comparing the average sexual function in the two training groups

Source of Changes	Total Squares	DF	Average of Squares	F	Significance Level	n2
Training * Group	7662.055	3	2554.018	36.106	0.001	0.357
Group * Test	27121.205	1	27121.205	383.415	0.001	0.663
Error	13793.495	195	70.736			
Total	303689	200				

**Table 5.** Results of analysis of covariance by comparing the mean of general health in two types of training

Source of Changes	Total Squares	DF	Average of Squares	F	Significance Level	n2
Training * Group	4981.94	3	1660.647	26.240	0.001	0.288
Group * Test	15242.58	1	15242.58	240.848	0.001	0.553
Error	12340.98	195	63.287			
Total	32565.5	200				

## Discussion

The present study aimed to compare the effectiveness of training based on choice theory and Pilates exercises on the components of sexual function and general health of infertile women. The results indicate that training based on choice theory has a greater impact on changes in sexual function of infertile women compared to Pilates.

Sexual function is formed in the socio-cultural system which defines cultural stereotypes or what is considered normal in the sexual function of infertile women. Infertility is a life crisis that can cause stress and severe psychological impact on couples. When infertility occurs to a person, the event itself fails to cause discomfort or anxiety; however, the perception of the event affects the sexual function of couples, especially in women. In such situations, sexual activity is accompanied by feelings of fear, failure, inadequacy, and loss which eventually lead to a sexual hash, failure to orgasm, and other sexual disorders.

Nelson Christian et al. [11] reported a positive and moderate relationship between index scores of sexual function in women and international scores of erectile function in men. Many studies have discussed problems such as premature ejaculation and erectile dysfunction in men and impaired desire,

sexual arousal, orgasm, and pain in women [12].

In general, according to the results of previous research and those of the present study, infertility can affect the sexual function of women and the stress caused by infertility problems is associated with a tendency to reduce the frequency of intercourse. According to Chen et al. [14-21], infertility with depression, anxiety, mental intolerance, general health, and lack of proper education predisposes infertile women to sexual dysfunction. In this regard, having a useful and effective intervention and training in sexual function, and a suitable and capable model to change behavior has a special priority in infertile women. The theory studied in the present study to improve sexual function in infertile women was training based on the choice theory and Pilates exercises. Training based on choice theory considers the intention to perform a behavior as its main cause. The intention is also influenced by attitudes toward behavior, abstract norms about behavior, and a sense of control over that behavior (in terms of ease or difficulty). The most important determinant of behavior in individuals is their choice. Teaching choice theory to individuals has increased their internal control and sense of responsibility and they consider themselves to be

responsible for their physical and mental health. In particular, the coaches of choice theory focus on behavior to create an active, responsible private relationship, and always consider the present behavior to achieve success. Furthermore, training analysis of interactive behavior assists individuals to convey their messages more clearly and achieve a better understanding of each other. Practicing the principles of reciprocal behavior analysis causes individuals to establish these habits within themselves and use constructive methods instead of using stressful behaviors such as blaming and arguing in problematic situations.

Another finding of the present study was the comparison of the effectiveness of training based on choice theory and Pilates exercises on the general health of infertile women which concluded that training based on choice theory had a greater impact on general health than Pilates exercises in infertile women. Studying health in women should be considered the main pillar of the family as infertile individuals fail to live normally without having children. The result of this mentality that one thinks has strayed from the natural laws of society is feelings of loneliness, isolation, and shame which can lead to other psychological problems. Infertility is stressful and negatively affects the psychological and general health of couples. Since infertile women fail to have good general and mental health due to the current situation, appropriate solutions should be found to improve their psychological state and mental health. According to the results of the present study, choice theory training sessions can be said to be one of the ways to improve the mental health of infertile women. Infertile women are theoretically trained to have maximum control over their lives and balance their psychological needs to feel safe and experience less anxiety. Using choice theory as an intervention can increase internal control and responsibility; therefore, people can effectively meet their own needs without compromising the needs of others and reduce adjustment problems. Also, the choice theory has a broad impact on various aspects of life and can improve public health. Choice theory and reality therapy significantly increase mental health by emphasizing the basic human needs, especially the exchange of love and affection and sense of value, and trying to address them during the education.

In the end, promoting public health in infertility clinics and offices by creating appropriate conditions as well as examining general health and the consequences of infertility in women is recommended in addition to common medical treatments to prevent Psychic restlessness and

sexual dysfunction. Since the intervention sessions of the present study have been effective for infertile women, the results of this study can reflect the ahead horizons in treating infertility and its psychological problems which is a bedrock for failure in the recovery process.

### Conclusions

According to the findings of the study, satisfaction with sexual function in women is significantly related to the level of general health due to infertility and psychological training promotes satisfaction with the relationship between couples.

### Compliance with ethical guidelines

All ethical principles were considered in conducting the present study.

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### Authors' contributions

Conceptualization (Susan Belir); Methodology (Kourosh Goodarzi, Mehdi Roozbahani); Investigation (Mohammad Ismail Ebrahimi, Keivan Kakabraee).

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### Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of the present study.

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