

# The effect of psychosocial interventions on anxiety and depression in infertile women and men in assisted reproductive treatment: a systematic review

## Abstract

**Background:** Infertility creates psychological and social problems in many infertile women, men or couples that the most common problems are anxiety and depression. Assisted Reproductive Treatments (ART), which includes: Intrauterine Insemination (IUI), In Vitro Fertilization (IVF), Intra-cytoplasmic sperm injection (ICSI) and etc increase anxiety and depression because success rates remain relatively low. Consequently numerous governmental, medical and community associations have recommended counseling.

**Aim:** The purpose of this review was to determine the effect of psychosocial interventions on anxiety and depression in this population.

**Methods:** Studies published between 1997 to 2017 and indexed in Medline, ISI Web of knowledge, Scopus, Elsevier and Google Scholar were reviewed. Studies were considered eligible if they evaluated the effect of psychosocial intervention on anxiety and depression in infertile participants and were published in English. In this review, all psychosocial interventions divided into 3 different groups, including cognitive-behavioral therapy (A category), mind-body interventions (B category) and other interventions (C category).

**Results:** All interventions based on cognitive-behavioral therapy, most of the interventions based on Body-Mind and some of the interventions in category C were effective in reducing anxiety and depression in infertile women and men.

**Conclusion:** Psychosocial interventions are effective in this population and should be utilized with greater frequency.

**Keywords:** psychosocial interventions, anxiety, depression, infertility, assisted reproductive treatment

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## Introduction

Infertility means not having children after one year of regular sexual life without using contraception techniques.<sup>1</sup> According to the World Health Organization (WHO) 8–10% of couples experience difficulties in conceiving. Infertility is a reproductive health problem and its prevalence is increasing in developing countries.<sup>2</sup> Infertile couples regard the iterative and long treatment periods as a recurring crisis.<sup>3</sup> Infertility causes psychological trauma for most couples, often experienced as the most stressful event in their lives.<sup>4</sup> While the infertility is not a disease, it and its treatment can affect all aspects of people's lives, which can cause various psychological-emotional disorders or consequences including turmoil, frustration, depression, anxiety, hopelessness, guilt, and feelings of worthlessness in life.<sup>5</sup> Fecundity has become a growing problem for many couples trying to conceive a child, and although not all couples choose to seek medical assistance, more than 10% of the childbearing population has resorted to assisted reproductive technology (ART) to conceive.<sup>6</sup> Diagnosis of infertility is varied and may include assessment of sperm quality, hormones and imaging analysis of the uterus/fallopian tubes. Dependent on the diagnosis, infertility may be treated by reproductive surgery, administration of hormones and/or assisted reproductive technologies (ART). ART encompass clinical/laboratory procedures where in male and female gametes are manipulated for the purposes of reproduction

and include in vitro fertilization (IVF), intracytoplasmic sperm injection, preimplantation genetic diagnosis, embryo cryopreservation and gestational surrogacy.<sup>7</sup> Men and women undergoing assisted reproductive treatment (ART) experience a number of stresses related to both the experience of infertility and participation in associated medical treatments.<sup>8</sup> The provision of psychosocial interventions for infertile couples has been recommended since the advocacy work of Barbara Eck directed research attention to emotional distress as a consequence of infertility rather than, as had been the emphasis until then, a cause of infertility.<sup>9</sup> According to Boivin, positive results from psychological interventions can occur in feelings of anxiety, tension, and worry, more than in depressive symptoms.<sup>10</sup> An updated review is needed to determine what psychosocial interventions may affect anxiety and depression related to infertility.

## Methods

This systematic review was performed in 2017 reviewing all studies published from 1997 to 2017 and indexed in Medline, ISI Web of knowledge, Scopus, Elsevier and Google Scholar. Studies were considered eligible if they evaluated the effect of psychosocial intervention on anxiety and depression in infertile women and men and were published in English. All of studies have been done in three psychosocial intervention compass.

## The interventions

Table 1 shows psychosocial interventions that these interventions generally are divided to three categories: A- CBT interventions B- Body-Mind interventions and C- Other interventions.

### CBT interventions

Cognitive-behavioral therapy (CBT) has been used successfully to resolve or reduce depression and anxiety in infertile women.<sup>11</sup> The following studies have been used cognitive behavior therapy in infertility counseling. Domar used cognitive-behavioral therapy on infertile women. Participants spent 2 hours in the CB group (A group were performed cognitive behavioral interventions in it) on a weekly basis for 10 weeks on a weekday evening and they were introduced to a wide variety of techniques, including relaxation-response training, cognitive restructuring, emotional expression, and nutrition and exercise information relevant to infertility.<sup>12</sup> In the study of Heydari that was carried out on infertile women undergoing IUI, cognitive behavioral therapy was applied in the experimental group individually and face-to-face for 10 minutes which contains information about (the anatomy of the reproductive system, sperm and Ovule, physiology of the fetus, how to perform the method IUI steps, anxiety symptoms and its effect on fertility, physiological changes during anxiety and relaxation as well as Focus technique training and breathing were taught for 10 minutes. Then each participants practice the technique and continue them to find skills.<sup>13</sup>

In Faramarzi research that was performed on infertile women, the therapist considered social, sexual, and relationship concerns of the infertile women for restructuring and eliminating in CBT sessions. Patients trained with the details of cognitive behavioral therapy and the causes of infertility in the first sessions. A gynecologist explained the cause of infertility for each patient. Cognitive interventions have been based on the premise that both negative automatic thoughts and dysfunctional attitudes to depression require restructure, eliminating the diathesis to depression. The next sessions included the identification and challenging of core dysfunctional or irrational beliefs that underlie automatic negative thoughts about the infertility. Finally, participants taught varying techniques (e.g. countering, self-reward) for maintaining the change of their dysfunctional beliefs about infertility. In addition to the above program, sessions 5–10 taught participants progressive muscle relaxation in a group setting.<sup>14</sup> In Noorbala study that was performed on infertile couples, cognitive-behavioral therapy included recognition of negative thinking to help the participants distinguish phobia from reality and thereby change their cognitive structure. For example, infertile women often believe that they will never be able to have a child. Through exercises, this negative pattern was changed to “I will do anything to have a child of my own. The behavioral techniques used included physical activity (including daily walking), muscle relaxation exercises, imagination exercises, expressing feelings, keeping a balanced diet, and planning free time according to one’s interests.<sup>11</sup> In Hamzehpour study that was performed on infertile women, cognitive behavioral education including emphasis on attitude, identification and rehabilitation of cognitive distortions, correct thinking techniques and also recognizing judgments and negative thoughts that they have an important effect on mental health in infertile women through reducing levels of anxiety, depression and other psychological problems. This effect starts over muscle relaxation and reduces the number of breathing and it will be over with nerves relaxation to control the muscle tension. Thus leading to physiological changes coordination and reduces anxiety and stress.<sup>15</sup> Hamzehpour study discussed about CBT and interactive expression of

thoughts, emotions, anxiety and depression-related behaviors, A-B-C behavior analysis skills in depression and anxiety and identifying dysfunctional beliefs and classify them, positive self-talks and its role in controlling of dysfunctional emotions and behaviors, muscle relaxation training, problem solving skill, its process and its effects on anxiety and depression, various examples of problem solving skill and its stages, objective analysis, logical analysis and benefit analysis in relation to anxiety and depression, social skills such as assertiveness, interpersonal skills and self-control, role of attribute in behavior and in particular its role in the treatment of anxiety and depression, training in relation to opposed beliefs and experience two incompatible emotional states, stop thinking and their role in control and reducing anxiety and depression.<sup>16</sup> In the study was performed on infertile women, starting of each session was relaxation training, including relaxation techniques exercises (relaxation techniques, breathing exercises and meditation). The Second part of each session was cognitive-behavioral methods training such as communication skills, problem-solving strategies, assertiveness, identifying and engaging with Irrational thoughts, anger management and planning of activities.<sup>17</sup>

### Body-mind interventions

A type of second interventions is study of Celia and colleagues that have been performed on anxiety of infertile women. In this study have been used Eastern Body-Mind-Spirit. Each participant in the intervention group was first interviewed individually by the first author, who was the therapist throughout the intervention. The group intervention consisted of 4 weekly sessions that each session lasted for 3 hours. EBMS emphasizes on health holistic dimensions which discusses about physical (bodily functions), psychosocial (emotions and interpersonal relationships), and spiritual (meaning of life) well-being are believed to be interconnected and all play a major role in the face of stressful life events. Concepts have taken from Chinese philosophies and Traditional Chinese Medicine (TCM) for the women.<sup>18</sup> The other Mind-Body interventions is Anna Galhardo research. She has used Mindfulness-Based Program (MBPI) method on infertile women with psychological problems. The MBPI is based on the Mindfulness-Based Program for Stress Reduction, the Mind/Body Program for Infertility, and basic principles of acceptance and commitment therapy (ACT). It is a structured group intervention targeting infertile women that aims to cultivate mindfulness and acceptance, helping them to move in a chosen and valued life direction. One of the main goals of MBPI is to promote psychological acceptance. MBPI is commonly as same as mindfulness programs. Participants have practiced mindful eating (the raisin meditation), 3-minutes breathing space, metaphors and experiential exercises, imagery exercise “10 years of marriage”, mountain meditation, hatha yoga for an hour by Kabat-Zinn in the Mindfulness-Based Stress Reduction Program, map of life (this exercise resembles that of the Mind/Body Program for Infertility and listening to classical.<sup>10</sup> Also Hoveyda has conducted Mind-Body-based interventions on infertile women with Mindfulness-Based Stress Reduction (MBSR) and conscious yoga. Treatment was done in 8-week program. Each session lasts about 2 hours. Mindfulness skills include thought-related meditation, relaxation and Hatha yoga that are taught for decreasing life stresses and raising awareness of the present moment. The sessions were about the introduction of automatic guidance system, knowing how to use present moment, awareness of bodily sensation, thoughts and emotions in reducing stress, practicing eating raisins, giving feedback and discussion about the practice, three-minute breathing, practicing breathing mindfulness meditation,

yoga stretching exercise, having conscious sitting with awareness of breathing (the sitting meditation), 5-minute practicing of “seeing or hearing”, explaining stress reactions of participants, examining awareness of pleasant and unpleasant events on feeling, thoughts and bodily sensations, practicing sitting meditation mindfulness of sounds and thoughts, practicing mountain meditation, sleep hygiene, making a list of enjoyable activities, examining and discussing programs, practicing stone, beads and marbles meditation.<sup>19</sup>

### Other interventions

The third category of articles are related to psychosocial interventions that have been called “other” interventions in Table 1 that include: Emotion- focused and Problem-focused coping, Counselling (Psychological support), Psychotherapy, Supportive psychotherapy, Experiential Psychosocial Therapy Interacting Cognitive Subsystem, Supportive psychotherapy, Online psychoeducational support Supporting stress management, Cognitive coping and Relaxation Intervention, Group positive psychotherapy, Group reality therapy. Debra used Emotion-Focused and Problem-Focused Group Therapies for women with Fertility Problems. The sessions were held weekly for 6 weeks. Both problem and emotion-focused coping skills are relevant for infertility. Problem-focused coping include the necessity for searching information in relation to diagnostic and treatment options, pursuing treatments designed to improve fertility, and communicating with partners and medical personnel to increase the probability of successful treatment. The emotion-focused treatment had three goals: to encourage emotional expression surrounding fertility concerns, to improve pleasurable activities and reducing negative affect associated with dysfunctional beliefs surrounding infertility. Emotion-focused strategies include expression and processing of feelings surrounding the experience, implementation of strategies designed to ameliorate negative emotions, and enhancement of communication skills to facilitate emotional expression and emotional support-seeking.<sup>20</sup> The other type of intervention group was support group on infertile women in Domar study. Support groups are the most common psychological intervention offered to infertile women. The support groups were modeled after groups offered through Resolve, an organization that offers standardized support groups in every state. The support group was designed to be representative of groups offered throughout the United States, not a minimal-treatment or quasicontrol group. Support group participants spent the 1st hr of each session “checking in” with each other on infertility treatments or issues that may have arisen since the previous week. The 2nd hour was spent on a different topic each week, including the impact of infertility on self-esteem, their marriage, family and friends, spirituality, and job.<sup>12</sup> The aim of the M.Emery study was to evaluate the RMU’s<sup>1</sup> model of routine pre-IVF counselling which focuses on the narrative capacities of couples. However, this model of counselling focusing on the narrative is clearly oriented toward psychological support. The hypotheses were that routine pre-IVF is acceptable to most couples, that it can contribute to lessening anxiety and depressive symptoms during and after the first cycle of IVF, and that couples feel they are helped through this form of psychological assistance.<sup>21</sup> In Yektatalab study, infertile women trained with group psychotherapy in the experimental group. It was 12 sessions; each session lasts 2 hours with 5-day intervals. subjects of psychotherapy include: discussion and education on the causes and diagnostic and treatment methods used in infertility, psychological aspects of infertility, the impact of depression and anxiety on the reproductive system, the process of crisis, also a session for screening in the reproductive field and some common treatments for

infertility. Each session began with muscle relaxation training then group process, support and cognitive procedures were used to reduce anxiety.<sup>22</sup> In klerk research, the intervention consisted of three sessions with a social worker trained in Experiential Psychosocial Therapy: one before, one during and one after the first IVF cycle. The objective of this study was to evaluate a psychosocial counselling intervention for first-time IVF couples. The main goal of experiential psychosocial therapy was teaching clients new (interpersonal) skills by forming not only a professional but also a personal relationship with them. Instead of being an objective observer, the counsellor expresses her own feelings and ideas about the client in order to create new interpersonal experiences for the client. It is based on that through these personal experiences with the therapist clients learn how to cope with (inter)personal problems.<sup>23</sup> Two articles of Nilforooshan were about cognitive-behavioral counseling based on Interacting Cognitive Subsystems (ICS). ICS contrast between the two levels of meaning, implicational and propositional. Implicational meanings encode schematic models of experience and they include elements directly derived from sensory sources. ICS approach emphasizes on the close relationship between the Implicational level and states of bodily arousal. Issues about infertility, anxiety appeared, feelings and thoughts, schemas and how are they designated and recognizing them, creating substituted schemes with control schemas, were discussed. Relaxation, concentration on breathing and mindfulness techniques were practiced. At sessions of second article the subjects got familiar with goals, definition of infertility, depression generation, its symptoms and the relationship between depression and infertility, relaxation practicing along with mental imagery, identification of thoughts and feelings, direct working on feelings, their acceptance without judgment and concentration on breathing, read body and mental imagery, focusing on thoughts (Expression of thoughts), practicing mindfulness, meditation and concentration on breathing and how to take care of themselves.<sup>24,25</sup>

1. The other intervention of Noorbala study was Supportive psychotherapy which is assessed.
2. The suitability of the psychological treatment, the cause of infertility, and the most suitable infertility treatment for each couple.
3. The depressed participants’ psychological and emotional responses to family, friends, and others.

The depressed participants’ self-esteem in their relation to partner, friends, colleagues, and others. Information regarding economic and other forms of social support was obtained using a semi-structured questionnaire modified for infertile couples.<sup>11</sup> Cousineau used Online psychoeducational support for infertile women to form of Solomon-four group design, 190 female patients were participated from three US fertility centers and were randomized into two experimental and two no-treatment control groups. This assessment serves as the tailoring mechanism of the online program, resulting in targeted feedback based on a high, medium or low confidence level in the areas of: Taking care of yourself, Managing your feelings, Your relationship with your partner, Managing your treatment and your relationship with your healthcare provider.<sup>26</sup> In Mori study, Supporting stress management performed for women undergoing the early stages of fertility treatment. Stress management is the ability to prevent increasing extreme physical and emotional distress by eliminating the causes of stress. Stress management education is stress-related health education with the intent of allowing healthy people to avoid becoming unhealthy and to improve their health. The experimental

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group was used to booklet A, entitled “A guidebook for women facing the challenge of infertility: You are not alone – self-management against stress”, and given homework assignments related to stress management. The participants used notebooks for a stress diary, a relaxation diary, a social support network, and a stress calendar. The notebooks were submitted by mail once per month and returned by mail with comments in terms of stress management. The researcher sent the stress management questionnaire by email, then participants responded and resubmitted.<sup>27</sup> Preparatory psychosocial counselling was performed for medically assisted reproduction by Hakim. The broad purpose of the session was to discuss the implications of pursuing IUI treatment and specific topics addressed included the role and availability of counselling services; the psychosocial and infertility history; potential concerns about IUI treatment; the experience of infertility-related stress on both individuals and the relationship; the utilization of coping strategies; availability and use of social support and any other stressors of concern. Counsellors addressed all topics to some extent but tailored the session to each couples’ expressed concerns. The counselling session typically lasted 60–90 min in duration.<sup>28</sup> Nekavand study was about the effect of relaxation on infertile women undergoing IVF treatment. Technique of progressive muscle relaxation is for reducing muscle tension or muscle contraction. Progressive muscle relaxation technique is a practice with a series of systematic steps that it educates the patients that they contract a group of muscles regularly then relax. This method neutralizes muscle tension. Progressive muscle relaxation increases activity of the parasympathetic cycle and it Neutralizes muscle tension. This method is done through traction contrasting modes and relaxing muscles by one’s own.<sup>29</sup> In Domar research, in vitro fertilization (IVF) patients in group of cognitive coping and relaxation intervention (CCRI) compared with routine care. The CCRI comprised a cognitive and a relaxation component adapted for the present study from two existing support interventions to help women cope with the stimulation and waiting phases of ART. The relaxation component of the CCRI consisted of relaxation techniques taken from the Mind/Body Program (MBP) for Infertility. The cognitive component of the CCRI was the Positive Reappraisal Coping Intervention. The PRCI intervention consists of an explanatory leaflet and a set of 10 statements designed to facilitate the use of positive reappraisal coping, a form of coping that helps people think more about the positive aspects of a difficult situation and dwell less on its negative aspects. The original PRCI was adapted for this study through the provision of a greater number of illustrative examples of possible benefits and positives of the stimulation and waiting stages of the ART cycle to help women generate their own personal examples.<sup>30</sup> Seyedi Asl worked on positive psychotherapy in infertile woman. The treatment of the control group was held six weeks after intervention group that treatment participated in six-week group positive psychotherapy. Each session lasted an hour and half. The meetings included the following six positive exercises:

- i. Using your strengths
- ii. Gratitude visit
- iii. A active-constructive response
- iv. Counting blessings
- v. Savoring
- vi. Biography

The subjects of sessions include: Opening and positive

introductions(VIA<sup>2</sup> strengths assessment to find out how to use one of your strengths every day), using your strengths(write and deliver a gratitude letter), gratitude letter(make an active-constructive responses in social interactions), active-constructive responses(each night before bed, write down three good things that happened), blessings(pick one thing you usually rush through and take the time to savor it, Write a short essay detailing the characteristics and accomplishments that you hope to be remembered for and consider how much time you dedicated to pursue these goals), biography and savoring(pick at least one exercise and try to integrate it into your everyday life).<sup>31</sup>

The Soltanzadeh study examined the efficacy of group reality therapy on infertile women undergoing treatment with assisted reproductive techniques (IUI). Group reality therapy in the experimental group were held over 10 sessions 1 and half hour. Tools of reality therapy include intense emotional relationship of the individual, facing with the facts, abandoning the irresponsible behavior and training of better behavior style. The sessions were about implementation of the pre-test and diagnostic interview, familiarity of members with the concept of reality therapy, emotional interaction, their own identity, characteristics of a successful identity, identity of defeat, responsibility for their behavior and importance and necessity of responsibility in life, anxiety management skills training, basic and effective needs in real life, how to plan problem solving, planning for their current life and for preparedness for the treatment assisted reproductive method IUI and denying excuses on the implementation of selected projects and programs.<sup>32</sup> The objective of Moenizadeh study was to examine the effectiveness of well-being therapy for depression in infertile women. WBT is based on an educational model which is structured, directive, and problem-oriented to present problems and situations. WBT includes technique of self-observation along with the use of a structured diary and interaction between patients and therapists. The therapy sessions are divided into three phases-initial, intermediate and final. The initial phase was first two sessions that their subjects included identifying incidences of well-being as well as applying the instructions into situational context regardless of its short period. The intermediate phase was about daily report of well-being incidences in which ranged from 0-100; 0 indicates lack of well-being and 100 illustrates full well-being. In the final phase (3rd to 5th session), the patients were encouraged to recognize the thoughts and belief which led to early cutting off of well-being. In the 6th to 8th session.<sup>33</sup>

Table 2 shows type of treatments in various studies include: IVF, IUI, ICSI, two of them or all of the women or couples who have used ART treatments. In these articles have been done twelve studies on women undergoing infertility treatments(ART), four studies on couples undergoing infertility treatments(ART), two studies on women undergoing IUI, one study on couples undergoing IUI, three studies on women undergoing IVF, two studies on couples undergoing IVF and one study on women undergoing IVF and ICSI. In these studies have been investigated the effect of psychosocial interventions on anxiety or depression or both of them. Instruments of studies to measure anxiety and depression include: Beck Depression Inventory (BDI), State-Trait Anxiety Inventory(STAI), Hamilton Rating Scale for Depression (HRSD), Beck Anxiety Inventory(BAI), Hamilton Depression Inventory, Beck Anxiety Inventory(BAI), Hospital Anxiety and Depression Scale (HADS), Beck Depression Inventory-II (BDI-II), Cattell Anxiety Inventory(CAS), Hamilton Depression Inventory, Newton infertility Anxiety Inventory, Anxiety, depression and stress questionnaire (DASS-21).

<sup>2</sup>take value in action

**Table 2** Type of treatments and instruments in articles

Author	Treatment Type	Research on		Instruments	
		Anxiety	Depression	Anxiety	Depression
Debra A et al.	IW	---	*	---	BDI
Alice D. Domar et al. (2000)	IW	*	*	STAI	HRSD & BDI
Heydari P et al. (2002)	IUI(women)	*	---	STAI	---
Emery et al. (2003)	IVF(couple)	*	*	STAI	BDI
Yektatalab Sh et al. (2004)	IW	*	*	BAI	HDI
C.de Klerk et al. (2005)	IVF(couple)	*	*	HADS	HADS
Celia H.Y et al. (2006)	IVF (women)	*	---	STAI	---
Nilforooshan P et al. (2006)a	IC	*	---	BAI	---
Nilforooshan P et al. (2006)b	IC	---	*	---	BDI-II
Faramarzi M et al. (2007)	IW	*	*	CAS	BDI
Ahmad A Noorbala et al. (2008)	IC	---	*	---	BDI
Tara M Cousineau et al. (2008)	IW	*	---	STAI	---
IW	*	---	CAS	---	
IW	*	*	HADS	HADS	
IUI (couple)	*	*	HADS	HADS	
IVF	*	*	STAI-YI	BDI	
ICSI(women)					
Hoveyda SH et al. (2014)	IW	*	*	DASS-21	DASS-21
IVF (women)	*	---	Newton infertility Anxiety questionnaire	---	
IW	*	---	CAS	---	
IW	---	*	---	HDI& BDI	
Alice D Domar et al. (2015)	IVF (women)	*	*	STAI	BDI
Seyed Teymur Seyedi Asl et al. (2016)	IW	---	---	---	BDI-II
IUI (women)	*		STAI	---	
Moeenizadeh M et al. (2016)	IW	*		DASS-21	DASS-21

IW, Infertile women(all of the women who have used ART treatments); IC, Infertile Couples (all of the couple who have used ART treatments); STAI, State-Trait Anxiety Inventory; BDI, Beck Depression Inventory; HRSD, Hamilton Rating Scale for Depression; BAI, Beck Anxiety Inventory; HDI, Hamilton Depression Inventory; HADS, Hospital Anxiety and Depression Scale; BDI-II, Beck Depression Inventory-II; CAS, Cattell Anxiety Inventory; STAI-YI, State Anxiety Inventory form YI; DASS-21, Anxiety, depression and stress questionnaire

## Results

In all studies (Heydari, Celia, Nilforooshan(a), Cousineau, Hamzehpourhaghighi(2009), Nekavand, Hamzehpour (2014), Soltanzadeh) discussed about impact of psychosocial interventions on anxiety of infertile women or couples had been seen a significant decrease in 3 studies of A category (CBT method), 1 study of category B (mind- body interventions) and 4 studies of category C (Other interventions).<sup>13-32</sup> In all studies discussed about impact of psychosocial interventions on anxiety and depression of infertile women or couples had not been seen a significant decrease in anxiety and depression in 3 studies of category C(M Emery, Klerk, Mori).<sup>21-27</sup> In 2 studies of Category A had been seen a significant decrease in anxiety and depression.<sup>12,14</sup> In both studies of Category B (Galhardo and Hoveyda), had been seen a significant decrease in anxiety and

depression in Galhardo study with the difference that Hoveyda study had revealed only reduction in depression but had not seen reduction in anxiety level after the intervention.<sup>10,19</sup> In 5 studies of category C (Domar 2000, Yektatalab, Lila Hakim, Domar 2015 and Moeinzadeh) had been seen a significant decrease in anxiety and depression that this impact had been seen only in two-thirds of women and half of men in Hakim study.<sup>12-33</sup> In all studies focused on impact of psychosocial interventions on depression of infertile women or couples, in 1 study of category C(Seyedi Asl) had not seen a significant decrease in depressive symptoms.<sup>31</sup> In 1 study of Category A (Talaei) and 3 other studies of category C (Debra. Nilforooshan(b), Noorbala) had been seen a significant decrease in depressive symptoms.<sup>11-25</sup> From above studies, we conclude that psychosocial interventions on anxiety and depression in infertile women and men undergoing ART technologies is effective.

## Discussion

In this review assessed the effectiveness of psychosocial interventions on anxiety and depressive symptoms of couples. In all studies of A category (CBT method), the samples were women except Noorbala study was conducted on couples. Also all of studies showed reducing anxiety and depression in this category. There is a study (Hoveyda) in category B that its result is different. Both studies of Galhardo and Hoveyda have used mindfulness (Mind-Body method) for intervention that in the study of Galhardo has declined anxiety and depression but in the study of Hoveyda only reduced depression while there was no significant decrease in anxiety.<sup>10,19</sup> In the category C, Counselling (Psychological support), Experiential Psychosocial Therapy, Group positive psychotherapy and Supporting stress management methods have not any effect on reducing anxiety and depression, but the other studies were effective.<sup>21-31</sup> From the Comparison of three groups in psychosocial interventions, we can say most of the psychosocial interventions has used cognitive-behavioral therapy method and the least interventions were in category C with the meaning of each methods of category C have used once from (1997 to 2017).

## Conclusion

Nowadays the role of systematic articles to better identify types of interventions is quite clear.<sup>34</sup> In the present study we found that the majority of psychosocial interventions are effective to reduce anxiety and depression in infertile women, men or couples. These studies had used several methods including: cognitive-behavioral therapy,<sup>11-17</sup> Eastern Body-Mind- Spirit, 18 Interacting Cognitive Subsystem,<sup>24,25</sup> Online psychoeducational support,<sup>26</sup> Relaxation,<sup>29</sup> Group reality therapy,<sup>32</sup> support group,<sup>12</sup> psychotherapy,<sup>22</sup> Preparatory psychosocial counselling,<sup>28</sup> Mindfulness- Based Stress Reduction program,<sup>10</sup> Mindfulness-Based Program for Infertility and group conscious yoga,<sup>19</sup> Well-Being Therapy,<sup>33</sup> Cognitive Coping and Relaxation Intervention,<sup>30</sup> Emotion- focused and Problem-focused coping,<sup>20</sup> Group positive psychotherapy<sup>31</sup> and Supportive psychotherapy.<sup>11</sup> Finally, more studies showed that psychosocial interventions have a positive effect on anxiety and depression in infertile patients but to find the most effective method of intervention should be more studies done in any of variety interventions.

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## Conflict of interest

The author declares that there is no conflict of interest.

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