



Supporting the treatment of infertility using psychological methods

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A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article

Humeniuk E, Pucek W, Wdowiak A, Filip M, Bojar I, Wdowiak A. Supporting the Treatment of Infertility Using Psychological Methods. *Ann Agric Environ Med.* 2023; 30(4): 581–586. doi: 10.26444/aaem/171874

Abstract

Introduction and Objective. The aim of the study was to review the current state of knowledge regarding the treatment of emotional consequences of infertility using psychosocial interventions and their effectiveness.

Review methods. The review was based on data obtained from scientific articles published in the Pub Med, Science Direct, the Cochrane Database of Systematic Reviews, Embase, Scopus, Ovid MEDLINE, Ovid EMBase, and The Cochrane Library between 1997–2022.

Brief description of the state of knowledge. Assistance offered to persons afflicted by the problem of infertility may take various forms, depending not only on the needs of those interested and the stage of treatment, but also on the capabilities of the staff (type and level of education). Commonly available, well-developed and researched methods of therapy are most frequently applied, often expanded by such elements as education concerning fertility and life style, and information about diagnosis and treatment. Modified methods of psychological intervention specially adjusted to persons struggling with infertility are also used. The indicators of the effectiveness of these methods are: reduction of stress, better coping with difficulties, decrease in the rates of psychological disorders, as well as an improvement of sperm parameters in men, and an increase in pregnancy and live birth rates.

Summary. The most frequently recommended methods of psychosocial intervention are these based on cognitive behavioural therapy and variants of stress reduction techniques. It is recommended that patients with infertility are provided with psychological care throughout the treatment period, and that the medical staff is equipped with standardized methods of assessing their mental state.

Key words

infertility, mental disorders, psychotherapy, psychosocial intervention

INTRODUCTION AND OBJECTIVE

Reproductive problems afflict an increasing number of couples at reproductive age. The effectiveness of treatment of infertility depends on many factors, including psychological assistance. The results of research show that incorporation of widely understood psychological assistance into routine practice in infertility clinics, although still underestimated, may bring about many benefits for couples struggling with infertility [1].

The emotional upheaval caused by the diagnosis of infertility may result in the deterioration of psychological functioning, quality of life and health of the relationship. It may also become the cause of a considerable delay or lack of seeking professional assistance, or resigning from treatment despite an optimistic prognosis [2]. In addition, there is evidence suggesting that stress caused by the diagnosis of infertility and its treatment may reduce the chance to conceive [3]. Although the results of studies in this area remain equivocal, most research reviews lead to the general conclusion that psychological factors, such as, symptoms of

depression, anxiety, stress and certain coping strategies, are related with reduced chances to become pregnant [4].

Many negative consequences faced by couples struggling with infertility prompt a discussion concerning the need for and methods of psychological intervention in this population [5]. The main task of such assistance is primarily the satisfaction of emotional needs, preparation for treatment, and protection against the deterioration of psychological health [6, 7].

The aim of this study was to review the current state of knowledge regarding the treatment of emotional consequences of infertility using psychosocial interventions and their effectiveness.

REVIEW METHODS

The review was based on data obtained from scientific articles published in the Pub Med, Science Direct, the Cochrane Database of Systematic Reviews, Embase, Scopus, Ovid MEDLINE, Ovid EMBase, and The Cochrane Library, between 1997–2022. The search was conducted with the use of the following key words: infertility, emotional dysfunction, emotional consequences of infertility, mental health, anxiety, depression, psychological intervention in

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Received: 20.04.2023; accepted: 17.08.2023; first published: 14.09.2023

infertility, psychological intervention, psycho-education, behavioral therapy, stress reduction techniques, effectiveness of the methods of psychological interventions.

DESCRIPTION OF THE STATE OF KNOWLEDGE

Diagnosis of infertility is perceived as a life crisis, an 'emotional rollercoaster', in which the emotional tension is equal to that occurring in the case of traumatic events [8]. Studies show that some couples are capable of adjustment and cope well with infertility; however, the remainder, most of whom are psychologically healthy, experience a number of negative consequences of infertility (Tab. 1).

Table 1. Consequences of infertility.

Emotional responses	high level of stress, symptoms of depression, anxiety, shame, feeling of guilt, anger, annoyance, grief, frustration, emotional lability, emotional exhaustion, helplessness, loss of control
Abnormal thinking	rumination, excessive information seeking, avoidance of recollections about fertility, a sense of loss or lack of femininity, low self-esteem, identity disorders, negative thinking about the future
Difficulties in the relationship	increased conflicts, arguments, domestic violence, divorce, sexual life disorders
Disorders in social relations	isolation, social anomie, weakened social support network, sense of social stigma, tense relationships with friends and family
Behavioural problems	reduced focus on actions related with fertility, alcohol abuse, loss of interests

Source: own study based on: [9, 10, 11, 12]

The above-mentioned consequences result most frequently not only from infertility itself, but also from invasive medical procedures, treatment, and its adverse effects, difficulties resulting from a demanding treatment schedule, as well as unpredictable results and lack of positive outcomes of treatment [13, 14]. The type and intensity depend on the stage of treatment, methods of diagnosing and treatment applied to-date, and duration of infertility. Experiences of failure and loss, perceived chances to conceive, previous psychological problems, problems in the relationship and problems in coping with negative emotions are also important [2].

Methods of psychological intervention in infertility. Assistance offered to persons afflicted by the problem of infertility may take various forms. This will depend not only on the needs of those interested and the stage of treatment, but also on the capabilities of the staff (type and level of education). Commonly available, well-developed and researched methods of therapy are most frequently applied, often expanded by such elements as education concerning fertility and life style, and information about diagnosing and treatment. Modified methods of psychological intervention specially adjusted to persons struggling with infertility are also used [15].

Methods based on cognitive behavioural therapy. While providing psychological assistance for couples afflicted with infertility, cognitive behavioural therapy (CBT) is often used, or techniques based on CBT. This therapy seems to be especially useful because it has a clearly determined structure, designated duration and predictable procedure.

This is a short-term therapy, oriented towards the goals and focused on current problems. The main assumption of this form of therapy is the belief that human thoughts, emotions and behaviours are mutually dependent, creating patterns of behaviours which are not always proper, and that thoughts exert an effect on the interpretation of a given situation, and not the situation itself. The aim of therapy is a change of the way of thinking which leads to the improvement of feelings and behaviours. In addition, the attention of the therapy participants is oriented towards modification of pathological patterns of behaviour and acquisition of new skills for coping with problems. Due to the acquired skills, the patient is able to interpret events more adequately, silence negative thoughts, better control own behaviours, and more effectively cope with emotions in a crisis situation [16].

The technique based on CBT dedicated to persons struggling with infertility is the Mind/Body Workout which consists of ten group sessions for women, and their partners participating in three of these sessions. The programme includes two sessions of cognitive behavioural therapy (CBT). Subsequently, for four weeks the participants learn various relaxation techniques, are encouraged to try each one, and subsequently to practice the technique(s) which they find most effective. During the seventh session of the programme, the participants are encouraged to practice mindfulness and keep a daily gratitude journal. The Mind/Body therapy proved to be an effective method for reducing stress and increasing the pregnancy rate [1].

An intervention based on the CBT dedicated to persons afflicted with infertility is the implementation of the 'grieving time'. The aim of this intervention is dealing with specific problems, such as rumination and excessive information seeking. The intervention consists in that a person devotes a certain amount of time (e.g. 10 minutes daily) to grieving. If grieving occurs outside the appointed time, the patient is encouraged to consider it during the subsequent time appointed to grieving. Although this technique may seem to be counter-intuitive, studies have demonstrated that it effectively reduces the amount of time spent on rumination [11, 16].

CBT therapy has been comprehensively tested and its effectiveness confirmed in a wide range of mental disorders, psychological problems, and medical problems with psychological elements [17, 18]. Neurobiological evidence from neuroimaging suggests that various forms of CBT are associated with modified activity in various regions of the brain, such as the prefrontal cortex (PFC) and amygdala [19].

Many studies evaluating psychological support for infertile couples based on cognitive behavioural therapy indicate numerous benefits, such as: improvement of psycho-social functioning, reduction of symptoms of depression, feelings of shame and failure, and social isolation [20]. The results of research have also demonstrated that in women who received psychological assistance based on CBT, fertility considerably improved, compared to those who did not receive such assistance [21, 22].

Stress reduction techniques. Diagnosis and treatment of infertility are associated with a high level of stress; therefore, the use of techniques for its reduction and teaching the methods of coping with stress, seems to be especially justified [1].

Relaxation is the skill of self-introduction into a state of relaxation, tranquility and mental rest by means of such techniques as: Jacobson's Progressive Muscle Relaxation, Schultz's autogenic training, and breathing control.

Jacobson's Progressive Muscle Relaxation (PMR) is a technique consisting in consciously contracting (along with the breath) and subsequently relaxing (with exhalation) of individual groups of muscles. During training, recorded instructions can be used which make it much easier to achieve a state of relaxation [23].

The subsequent, frequently used technique is Schultz's autogenic training evoking through autosuggestion sensations similar to a meditative state or hypnosis. The state of relaxation is achieved by gradual entry into the state of deep muscle relaxation, and tranquility of the mind. The psychiatrist proposes six stages of training, successively passing through the feeling of heaviness and warmth in different parts of the body, regulation of the heart rate, regulation of breathing, evoking the sensation of warmth in the abdomen, and finally a cool sensation on the forehead [24].

The results of studies show that the reduction of muscle tension exerts a beneficial effect on the nervous system, reduces the level of anxiety, and helps to cope with tension in daily life situations [1]. It has been confirmed that relaxation techniques decrease negative emotions in patients, and considerably reduce the level of anxiety in women undergoing infertility treatment [25]. In addition, progressive muscle relaxation (PMR) decreases the level of stress in couples during treatment for infertility [23].

Relaxation techniques applied in the therapy of patients with infertility also include methods of breathing control. This is a very simple group of methods which may be used practically at any time and place, allowing quick control of stress. These techniques are based on belly breathing, i.e. diaphragmatic breathing, or slow breathing. Due to this, the breath deepens, while the body relaxes. The skill of breathing control is also the basis for other relaxation techniques and, as confirmed by research, a change of breathing pattern exerts an effect on the nerve centres engaged in the regulation of emotions [26, 27].

A short psychological intervention of a relaxation type applied in infertile couples is expressive writing intervention (EWI). The participants are instructed to reveal in writing their deepest thoughts and feelings arising from a difficult life event [28]. Revealing emotions, in addition to reducing emotional stress, may also positively affect the results related with physical health [29]. Studies conducted among infertile persons showed that the application of the EWI was associated with the reduction of stress, and the effects maintained themselves after even up to six weeks post-intervention [30]. In another study, the researchers noted that the reduction of the symptoms of depression was observed in both partners [31].

Mindfulness. Mindfulness meditation (MM) is a type of therapeutic intervention consisting in paying attention to the present moment, observation, description, and acceptance of everything that is experienced, but without judging and acting [32]. Practising MM enables a change in the way in which we refer to events, and associated with them, thoughts and emotions [33].

By integration of MM with conventional methods of psychotherapy many therapeutic programmes have been

developed. One of them is a group module consisting of eight weekly sessions, aimed at the reduction of emotional stress related with physical pain (mindfulness-based stress reduction-MBSR). The programme places emphasis on being aware of the sensations in the body, and subsequently expanding them in order to effectively regulate thoughts and emotions [32]. Also, the eight-week MM module, additionally based on the elements of CBT (mindfulness-based cognitive therapy – MBCT), is aimed at the reduction of symptoms and relapses of depression [34].

Another MM module specially addressed to infertile patients, additionally based on basic principles of acceptance and commitment therapy, is the Mindfulness-Based Programme for Infertility (MBPI). This is a structured ten-week group intervention promoting flexibility and acceptance as the ways of coping with a difficult life experience. After its application, a significant decrease was observed in the symptoms of depression, internal and external shame, and sense of failure [35].

The mechanism of change evoked by therapy based on MM is two-fold. Firstly, mindfulness training leads to the stabilization of cognitive skills, autonomic arousal and emotion regulation, which helps to break the vicious circle of negative thinking in infertility. Secondly, practising MM helps in coping with the specific stressors related with infertility [36]. Due to the acquired techniques, the patients more easily recognize situations which induced stress, are able to perceive their feelings and problems and confront them, which results in the reduction of tension and considerably higher satisfaction with life and marriage. In addition, in group variants of MM, the support by other participants is important. As a result, infertile couples do not feel lonely and see that they are not alone in struggling with infertility [37, 38, 39].

A study carried out in patients undergoing IVF showed that in women participating in MM intervention, a considerable increase was observed in mindfulness, self-compassion, constructive strategies of coping, and primarily a higher rate of pregnancy [40]. A study conducted in 2018 by Galhardo et al. confirmed a reduction in the symptoms of depression, and an increase in the skills of coping with infertility in a beneficial manner. Preliminary data also indicate the maintenance of benefits after six months [41].

Scientific evidence confirms that modules based on MM are more effective in the case of infertility than traditional psychotherapy, because they focus on a wider spectrum of psychological problems typical of infertility and strategies of coping with these problems [42, 43].

Gratitude practice. The subsequent technique applied in work with patients struggling with infertility is interpersonal psychotherapy (IPT). This is a time-limited evidence-based therapy which uses such methods as communication analysis and role playing in order to solve four major interpersonal problems: interpersonal disputes, changing roles, grieving, and interpersonal deficits [44]. This technique proved to be an effective method of working with infertile patients. The interpersonal problems of these patients concerned, among other things, disagreements between partners pertaining to further steps in treatment, or negative interactions with significant others [45]. The IPT method also proved to be effective in the therapy of depression in women [46]. At the beginning, the therapist places emphasis on a medical

model of depression concomitant with infertility, carries out psycho-education concerning depression, and subsequently analyzes patterns of interpersonal relationships to discover in what way they connect with the experienced depressive episode.

At the next stage there takes place identification of the problem, construction of social skills, support and normalization of affect. The use of this programme considerably reduced the symptoms of depression, anxiety, stress related with fertility, and improved interpersonal functioning [45].

Self-administration methods. Psychotherapeutic interventions for infertile couples are not always available, or are not used at all. Although the majority of patients struggling with infertility express the need for psychological support, less than 25% of them join psychological intervention programmes. The causes of this situation are indicated as being, among other things, lack of time, other duties, and financial limitations [4, 47]. The data show that only 18%–21% of patients participate in sessions when they are available cost free, whereas the majority use one to three sessions on average [5]. Therefore, psychological interventions for self-administration have been developed, which have many advantages. These interventions are easily available and do not require time and financial outlays [48].

One of the examples of self-help interventions is the Stress Management and Resiliency Training (SMART). The SMART therapy, which is a cognitive behavioural intervention, teaches self-consciousness, mindfulness, relaxation based on respiration and gratitude, compassion and acceptance. A study conducted in 2015 indicated that the SMART therapy is effective in the reduction of generalized and fertility-related stress, and considerably improves the quality of life in both man and women undergoing in vitro fertilization [49].

Another example of effective self-use psychological intervention is the cognitive coping and relaxation intervention (CCRI). The results suggest that patients using CCRI presented more positive evaluations of coping, better quality of life and lower anxiety. In addition, the participants of this intervention showed by 67% lower rate of resigning from treatment than persons from the control group [13].

Another tool designed for self-administration is positive reappraisal coping intervention (PRCI). Patients are encouraged to use the forms of coping based on perception of positive aspects of stressful situations. A chart is applied consisting ten statements and an information form concerning coping, designed to stimulate constructive forms of coping. This tool occurred to be especially useful in the case of unexpected and uncontrolled stressors, such as, e.g. 2-week period of waiting after embryo implantation [50, 51].

The subsequent self-administration tool, very simple and easy to use which to a minimal degree disrupts daily functioning is the practice of gratitude [52]. This consists in keeping a gratitude journal where the participants for three weeks every day write down the things for which they are grateful and why [53]. Gratitude has been conceptualized as an emotion, attitude, habit, personality trait, strategy of coping, or life orientation focused on thinking about positive aspects of a difficult situation and appreciating the positive aspects of the world [54]. Intervention based on gratitude may buffer the negative effects of infertility. Evidence shows that it reduces depression and the level of stress, and improves wellbeing [55].

General assessment of the effectiveness of the methods of psychological assistance in infertility. The indicators of the effectiveness most often used in the assessment of psychological assistance are: reduction of stress, better coping with difficulties, decrease in the rates of psychological disorders, as well as an improvement of sperm parameters in men and an increase in pregnancy and live birth rates [25].

Within the recent years many meta-analyses have been carried out assessing the effectiveness of psychological interventions in patients with infertility; however, their results are compatible.

Boivin (2003) in her meta-analysis included 25 studies and drew the following conclusions:

- 1) Interventions exerted a greater effect on the reduction of anxiety, tension, and worries than the reduction of the symptoms of depression and improvement of interpersonal functioning.
- 2) Psychological interventions had no significant effect on pregnancy rates.
- 3) Group interventions, placing emphasis on training skills are more effective than those concerning emotional expression and support.
- 4) Both men and women used interventions to an equal degree [4].

In 2009, Hämmerli et al. analyzed 21 reports and did not find any significant effects of psychological interventions in the area of psychological health. However, a significant increase was observed in pregnancy rates, but also in couples not using assisted reproductive technology. Researchers observed that interventions of six or more sessions exerted a more beneficial effect than short-term therapies, and that women benefited more than men [56].

Frederiksen et al., 2015, considering 39 reports concluded that there are statistically significant and solid positive effects of interventions in the area of reduction of unfavourable psychological effects. The size of these effects was higher in women than men, and higher pregnancy rates were related with a decrease in anxiety. In women who received some form of psychological intervention the probability to conceive was twice as high as in the control group receiving standard care [14].

Ying et al. 2016, conducted a systematic review of 20 reports and concluded that the studies which brought significant results, concerning both pregnancy rates and psychological stress contain many methodological errors [57]. Also, the subsequent meta-analysis of 2026 including 39 studies allowed the conclusion that the quality of the analyzed studies did not give rise to any binding conclusions [58]. In turn, the third review of 2016 including only 12 reports allowed the conclusion that psychological interventions are related with lower psychological stress, higher pregnancy rates, and a greater satisfaction with marriage [59].

Zhau et al. 2021 considering 29 reports (total of 3,522 adult participants) concluded that psychotherapy can lead to improvements in the pregnancy rate for infertile patients, especially for patients receiving assisted fertility. In addition, it may help improve total psychological scales associated with infertility and depression. CBT and BMS play an important role in improving rate of pregnancy, and BMS is associated with reducing anxiety [20].

SUMMARY

The performed analysis of studies showed that that couples struggling with infertility may experience many psychosocial problems. This created the need to search for effective methods of psychological intervention in this population [33]. The research results, although ambiguous and not devoid of methodological errors, indicate that the use of these methods may bring effects in the form of reduction of stress, better coping with difficulties, decrease in the rates of psychological disorders, as well as an improvement of sperm parameters in men and an increase in pregnancy and live birth rates [5]. The most frequently recommended methods of psychosocial intervention are those based on cognitive behavioral therapy and various variants of stress reduction techniques. All methods interventions should be expanded by education concerning fertility, life style, and information about diagnosing and treatment.

An important suggestion from the research is the need to increase the knowledge of medical staff about the psychosocial consequences of infertility and the possibilities offered by various methods of psychological intervention. Since not every person struggling with infertility requires such help, it is important that medical staff be equipped with standardized methods of assessing the mental condition of patients and take appropriate action if necessary [10].

Infertile couples should be covered with psychological assistance for the whole period of treatment, and also when efforts have failed, in grief after the loss of an unborn child, when hope for biological offspring is lost, and the decision must be made about adoption or remaining childless [60]. Psychological care should be provided to infertile couples throughout the treatment period, as well as when their efforts are unsuccessful, in mourning for an unborn child, when hope for biological offspring is lost and decisions about adoption or remaining childless must be made [7, 61].

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