

## Review Article

## Asian Pacific Journal of Reproduction

Journal homepage: [www.apjr.net](http://www.apjr.net)

doi: 10.4103/apjr.apjr\_43\_24

## Psychosocial interventions for infertile couples: A scoping review

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**Objective:** To bring out current evidence regarding psycho-social interventions for infertility care, and identify the best practices in clinical care.

**Methods:** An in-depth literature review on infertility care intervention was conducted using data from multiple databases: PubMed, EMBASE, Google Scholar, and PsycINFO. The relevant articles selected were between 2008 and 2022.

**Results:** A literature search turned up 1798 citations, of which 25 studies were included after rigorous analysis. Various intervention categories have been constantly utilised to provide support and promote mental health, of which acceptance and commitment therapy (ACT) and cognitive behaviour therapy (CBT) were used most frequently. The interventions exhibited diversity in both content and composition, and addressed a wide range of issues.

**Conclusions:** The review emphasizes that psycho-social interventions have a positive effect on psychological issues, relationships, and pregnancies among couples and can be incorporated into fertility-care practices.

**KEYWORDS:** Infertile couples; Psychosocial interventions; Mental health; Quality of life

**1. Introduction**

Globally, infertility is now recognized as a public health problem that affects individuals, communities, and groups against all cultures. Today, infertility and sterility have been recognized as a stern issue of public health around the world. The World Health Organization (WHO) identifies infertility as the third most severe disease in the world in this century, after cancer and cardiovascular disease. The situation in India is not different either. In India, the fertility rate dropped nearly 50% from 36.7% in 1975-1980 to 18.9% in 2015-2020. By 2045-2050, the United Nations 2022 Revision of World Population Prospects predicts a fertility rate of 12.1[1,2]. In India, where family values are highly cherished, having children is a great accomplishment for any marriage. Anxiety and sadness are more frequent in women than males, and infertility can have a major

influence on their mental health[1–3]. The emerging infertility clinics add to this evidence, but it also indicates that people are looking for solutions even though it is expensive. Intervention research for infertile couples to enhance their quality of life was found to be nearly absent in the context of India. The need for psychosocial intervention also is on the rise[4].

Infertility has become one of the most serious and underappreciated reproductive health issues in developing countries[3]. The transition to parenthood is one of the most significant changes that both men and women face in adulthood. The experience of infertility is stressful for couples and involves several mental health concerns such as marital quality, fear of divorce, decreased intimacy, depressive symptoms, anxiety, irritability, low self-esteem, and sexual dysfunction. Infertile couples experience stigma, a sense of loss, and low self-esteem[5–8].

The demand for advanced reproductive technology services is growing around the world, especially for those who have difficulty conceiving[6]. The procedure is quite often complex, expensive, and invasive, with a low rate of success, and couples frequently forego treatments due to the strenuous psychological experience[6,7]. Women report more unpleasant experiences than men, including identity loss, lower self-esteem and overall well-being, and elevated levels of depression, anxiety, shame, stigma, and stress. Both sexes experience comparable levels of marital and sexual unhappiness[9].

Due to the considerable psychological distress experienced by infertile couples, various interventions such as psychosocial interventions, therapy, and psychoeducation have been developed to provide aid, but mostly it is limited to Western countries[10]. Interventions can be given in group or individual sessions[11].

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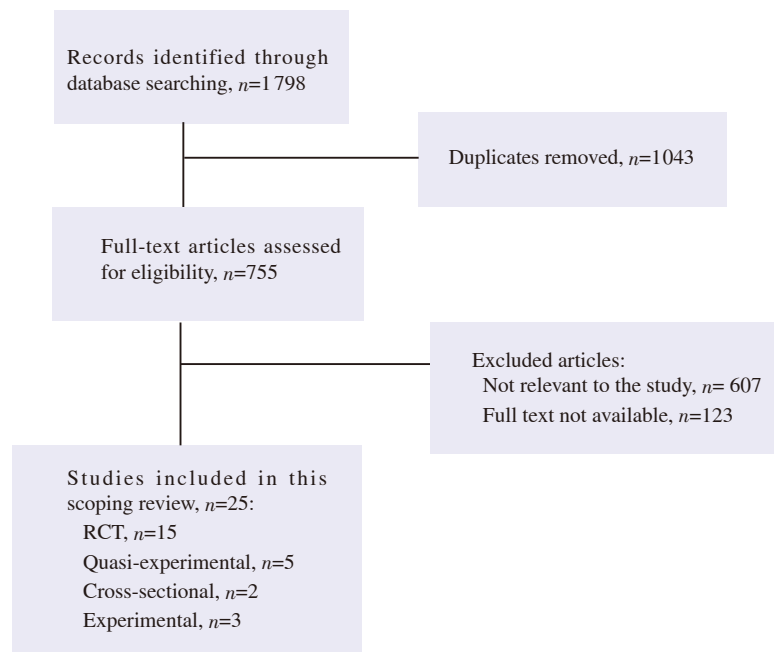
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**How to cite this article:** Sunil S, Anish KR. Psychosocial interventions for infertile couples: A scoping review. *Asian Pac J Reprod* 2024; 13(3): 97-106.

**Article history:** Received: 4 March 2024; Revision: 29 March 2024; Accepted: 15 April 2024; Available online: 31 May 2024



**Figure 1.** Flowchart of search retrieval process.

Psychosocial interventions provide emotional, social, and educational support to infertile couples[6,9,12]. Psychosocial interventions have shown promising effects in improving psychological outcomes, marital relationships, and pregnancy rates in couples[3,9,11]. Systematic reviews point out that psychosocial interventions that are based on sound evidence could be effective in improving clinical pregnancy rates[13,14]. Interventions in the form of counselling and psychosocial interventions in the field of infertility can provide support and information that can lead to improved mental health and the empowerment of infertile patients. A review is therefore timely. The literature on this field is rapidly evolving, which is why this review seeks to review current evidence regarding knowledge-based interventions for infertility care, building on existing knowledge. Identify the best practices in clinical care that can be adopted in developing countries where infertility counselling is yet to flourish.

## 2. Methods

The research question was formulated[15] to address the following: "What types of psychosocial interventions exist in infertility settings?" and "What are the key elements of these interventions?" To seek research work based on infertility care intervention studies published between 2008 and 2022, a systematic literature search was carried out. Using a syntax that included 'psychosocial', 'intervention', and synonyms with their meanings, and with 'infertility,' 'IVF,' and 'Assisted Reproductive Technology,' and their synonyms, a thorough search was directed through several electronic databases (PubMed, EMBASE, Google Scholar, and PsycINFO). The references were checked to make sure that no

important studies were left out. After removing duplicates from the list of retrieved titles and abstracts, we went through each study's full text using our inclusion criteria. The criteria included that the study had to be written in English, that the study had to evaluate an intervention tailored to infertile patients, that the intervention had to be implemented as part of infertility care and that the study population had to consist of people with infertility (whether self-reported or diagnosed). A large number of recently published studies that typically adopted a randomized controlled trial (RCT) design were also decided to be included. This was followed by: Mapping the data, collating, summarizing, and documentation of results; Descriptive statistics were used for data summarization and classification. Each study included in this review underwent separate data extraction using a standardized data charting sheet. To get a feel for the studies, we compiled information on factors like study design, study context, population characteristics, recruitment settings, and intervention names. Second, we looked into what went into each intervention and pulled out the most important parts. This scoping review uses the methodological framework of the studies from Arksey and O'Malley[15].

## 3. Results

### 3.1. Literature search and assortment of studies

The literature quest resulted in 1798 citations. After the search retrieval process as demonstrated below, we included 25 studies in this scoping review, which included articles from 2008 to 2022. Figure 1 depicts the search retrieval process.

### 3.2. Study designs

Of all studies, 15 were randomized control studies, five were quasi-experimental studies, two were cross-sectional studies and another one was an intervention control study. A study by Hussein was a cross-sectional study followed by quasi-experimental. The remaining one was an experimental pretest-posttest study with the control group.

### 3.3. Mapping the data, collating, summarizing, and reporting the results

The data collected were charted and summarized. In total, 25 studies were included which comprised 15 randomized controlled trial (RCT), five quasi-experimental studies, three experimental and two cross-sectional studies. Research from across the world was included. 12 Studies were from Iran, 2 from Denmark, 2 from China, 4 from the USA and one study each from India, Spain, Netherlands, Iraq and Israel. Intervention studies conducted between 2008 and 2022 are included in this review. The sample size varied from 30 infertile women to 280 infertile couples. The characteristics of the study are summarised and demonstrated in Tables 1-4.

### 3.4. Population of study

Populations varied from study to study. The vast majority of studies conducted interviews with infertile individuals or couples, fourteen studies only interviewed women, and ten involved infertile couples. The participants were exposed to all the relevant study phases at fertility care centers. They included individuals who reported their infertility, had initial diagnostic assessments, and received various forms of treatment. The research participants were of various nationalities, but the online interventions involved infertility patients from around the world.

### 3.5. Goals addressed by the intervention

Multiple goals were pursued by the interventions, including the enhancement of mental health, the mitigation of marital issues, reducing distress and improving pregnancy rates, quality of the marital relationship, psychological defence strategies, stress management, viable pregnancy rates, depression in infertility, psychological well-being of women, the quality of infertile couples, interventions for depression, self-esteem, marital adjustment and anxiety of infertile women, education and support program, psychological intervention focused on stress management, harp therapy and stress reduction, sexual function of women, effectiveness optimism of life[12,16-31].

### 3.6. Main categories of interventions

There are six therapeutic interventions, four psychosocial

interventions, four online interventions and three skill enhancement programs.

#### 3.6.1. Therapies

Four studies mainly focused on acceptance and commitment therapy (ACT) which mainly focused on psychological well-being, optimism in life, sexual relationships, quality of life and mental health. Three studies were on infertile women and one was with infertile couples[20,21,25,32]. Cognitive behaviour therapy (CBT) was used in six studies that focused on infertility stress, alleviating depression, and general stress and one intervention focused on viable pregnancy rates where five focused on women participants and one was for infertile couples[3,26,29,33-35]. One study was based on stress management which was based on cognitive-behavioural techniques that studied the marital satisfaction among infertile women[3]. Mindfulness-based cognitive infertility stress therapy (MBCIST) focuses on women's mental health and development, including self-acceptance, healthy relationships, self-control, and an autonomous environment[30]. Harp therapy (a musical instrument) was used as an intervention to study anxiety and stress. There was found to be an increased pregnancy rate[24].

#### 3.6.2. Psychosocial interventions

An intervention called partnership and coping enhancement program (PCEP), which is a program for couples[36], has been developed based on the Preliminary Partnership and Partnership Conceptual Framework (PPCCF) for young couples, couples undergoing *in-vitro* fertilization (IVF) treatment, sharing experiences, psychological education, meditation exercises and practical skills. Five studies were based on psychological interventions which mainly aimed at marital satisfaction, stress management, depression, anxiety and self-esteem[22,37,38]. One study implemented the interventions from CBT as psychological interventions, which focused on therapy (individually) and Fluoxetine (antidepressant)[27]. The purpose of the body mind spirit intervention study (IBMS) was to evaluate the efficacy of a group intervention focused on improving the emotional and spiritual health of Chinese women undergoing their initial round of IVF[11].

#### 3.6.3. Online interventions

The influence of smartphone-based social media sex counselling on infertile women's sexual perceptions was studied in a smartphone-based social media intervention[39]. Internet-based mind/body program was aimed to reduce distress and increase the likelihood of conceiving[18]. The intervention named 'online psychoeducational support' emphasized cognitive-behavioural skill building and stress management techniques[19]. An intervention using web-based CBT was used to study stress among women interventions for anxiety, stress, grief, depression, and relationship stress; psycho-education and skill-based approaches were applied in this intervention[29].

**Table 1.** Description of the studies based on therapy interventions.

Therapy interventions	Author	Aim of the study	Components of intervention	Results
Cognitive behaviour therapy (CBT)	Solati <i>et al</i> , 2016	Manage stress using group CBT	Stress management, CBT for marital satisfaction.	CBT increased marital satisfaction in infertile women.
	Noorbala <i>et al</i> , 2008	Impact of intervention before or during infertility treatment.	Recognition of negative thinking to help the participants distinguish phobia from reality and thereby change their cognitive structure, supportive psychotherapy.	Useful in alleviating depression in infertile couples before they received infertility treatment.
	Sexton <i>et al</i> , 2010	Efficacy of a web-based CBT.	Interventions for stress, anxiety, depression, grief, and relationship stress. Psychoeducation and skill-based approaches.	General stress was reduced using online CBT.
	Faramarzi <i>et al</i> , 2013	Effectiveness of CBT for improvement of infertility stress in infertile women.	Cognitive therapies-dysfunctional attitudes to social concerns, sexual concerns, marital concerns, rejection of childfree lifestyle, and need for parenthood. Progressive muscle relaxation of Jacobson.	CBT is reliable in resolving and reducing infertility stress.
	Mosalanejad <i>et al</i> , 2012	Reduce stress, anxiety and depression of women undergoing assisted reproductive therapy (ART).	Recognizing distorted or negative thinking; Negative thought blocking techniques; Improving the couple's sexual relationship.	CBT can be useful and applicable to women who receive ART to reduce psychological distress, anxiety, depression, and stress.
	Sahraeian <i>et al</i> , 2019	Effect of CBT on sexual function in infertile women.	Behavioural-systems approach to marital and sexual problems, group-based sexual counselling with a cognitive-behavioural approach.	Sexual-function domains, including sexual desire, arousal, lubrication, orgasm and satisfaction significantly increased following CBT implementation.
Acceptance and commitment therapy (ACT)	Hosseinpanahi, 2019	Effect of ACT on mental health and quality of life in infertile couples.	Specifying the thoughts and their underlying feelings, and identifying the strengths of the participants, mindfulness techniques. Concept of values commitment actions & teaching cognitive dissonance.	ACT was found to be effective in clinics to enhance quality of life of infertile couples.
	Rahimi <i>et al</i> , 2018	Effect of ACT on the quality of life of infertile women.	Creative helplessness; Mindfulness with conscious breathing exercises, defusing from unpleasant thoughts and feelings; Willingness and acceptance; Stating values and commitment.	ACT improved the quality of life.
	Hasanzadeh <i>et al</i> , 2019	Effectiveness on psychological well-being and sexual function of infertile women.	ACT worksheets on values, acceptance, committed action, dealing with sexual satisfaction.	ACT has an effective role in promoting the psychological well-being and sexual function of infertile women.
	Haji-Adineh <i>et al</i> , 2019	Effectiveness of ACT on optimism of life and psychological well-being of infertile women.	Practicing mindfulness, conscious breathing, focusing on control as a useless strategy, daily desire memories, controlling unpleasant emotions, committing to action; Self-compassion training & attention to values.	ACT increased optimism, positive relationship with others, independence, can reduce suffering of and improve psychological optimism and well-being.
Mindfulness-based cognitive infertility stress therapy (MBCIST)	Tahere Rahmani Fard <i>et al</i> , 2018	Enhance psychological well-being of infertile women.	Mindfulness-based stress reduction, mindfulness meditation techniques, cognitive therapy-based domains of infertility stress.	Effective for improving the psychological well-being including self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth.
Couples therapy	Ahmadi <i>et al</i> , 2019	Improvement of mental health and reduction of marital conflict in infertile couples.	Marital conflict, behaviour therapy, listening skills, communication skills, marital attribution. appropriate nonverbal and verbal behaviours, reinforcement, punishment and mutual relations, problem solving skills.	Couples therapy is beneficial for mental health and marital conflict between males and females.

**Table 2.** Description of the studies based on psychosocial interventions.

Psychosocial interventions	Author	Aim of the study	Components of intervention	Results
Partnership and coping enhancement program (PCEP)	Ying <i>et al</i> , 2016	Examine the acceptability and feasibility of the intervention and effects of PCEP on couples.	Sharing of experiences, psycho-education, and meditation exercises, and practising of skills.	PCEP is feasible and acceptable.
Psychological intervention	Heredia <i>et al</i> , 2020	Effectiveness on stress management in women undergoing <i>in vitro</i> fertilisation (IVF).	Psycho-education; Basic concepts; Managing anxiety/stress; Diaphragmatic breathing; Mental relaxation; Sleep hygiene, concerns planning.	Benefits the psychological adjustment of women undergoing IVF in reducing their anxiety.
Psychological intervention	Hussein, 2014	To enhance marital satisfaction of infertile couples.	CBT & supportive psychotherapy, changing cognitive patterns.	Improved mental health and quality of life of couples.
Psychological intervention programme	Kharde <i>et al</i> , 2012	Effect of intervention on depression, anxiety, self-esteem and marital adjustment of infertile women.	Coping strategies, stress management by relaxation, response training, progressive muscle relaxation, deep breathing and meditation life style modifications.	Effective intervention in alleviating distress related to infertility.
The integrative body-mind spirit (I-BMS) intervention	Chan <i>et al</i> , 2012	Efficacy of a group I-BMS intervention, at improving the psychosocial and spiritual well-being.	Physical health, psychosocial well-being emotional and interpersonal relationships, spiritual well-being, stress-reduction training coupled with stretching exercises, acupressure, massage, meditation, and breathing techniques.	I-BMS intervention was successful at improving the psychosocial and spiritual well-being of women undergoing their first IVF.
Psychosocial intervention	Ramezanzadeh <i>et al</i> , 2011	Effect of intervention on the pregnancy rate of infertile couples.	CBT, supportive psychotherapy, cognitive structure, behavioural techniques, muscle relaxation exercises, imagination exercises, expressing feeling.	Increased pregnancy rate.
Marital relationship counselling	Vizheh <i>et al</i> , 2013	Effect of counselling on quality of marital relationship of infertile couples.	Aspects of personal life, sexual and marital satisfaction, communicative skills. Problem-solving skills, approaches for improving sexual satisfaction.	Improved marital and sexual satisfaction in infertile men and women.

**Table 3.** Description of the studies based on online interventions.

Online interventions	Author	Aim of the study	Components of intervention	Results
Social networking	Yazdani <i>et al</i> , 2019	Effect of sexual counselling <i>via</i> social networks on Smartphone in sexual self-concept of infertile women.	Expressing feelings and beliefs about sexual behaviours and problem-solving skills and accepting supportive relationships, satisfaction and communication, confronting shame.	Effective in improving the sexual self-concept in infertile women, thus ameliorating the couples' sexual relations.
Internet-based program	Clifton <i>et al</i> , 2020	Reduce distress over the course of the intervention and increase likelihood to conceive.	Mirror the face-to-face mind/body for fertility program in structure, included information & exercises structured into ten modules, included text, audio, video, interactive elements, and electronic downloads for homework completion.	Research design and program specific to this population are feasible and acceptable.
Online education	Cousineau <i>et al</i> , 2008	Effectiveness of a brief online education and support program for female infertility patients.	Taking care of yourself; Managing your feelings; Your relationship with your partner; Managing your treatment & Your relationship with your healthcare provider.	Web-based patient education intervention was beneficial psychological domains and is cost effective resource for fertility practices.

### 3.6.4. Skill enhancement

Expressive writing interventions were developed and found to be effective in lowering emotional distress and increasing pregnancy rates in assisted reproductive technology-treated couples[23]. Self-administered coping intervention was aimed at investigating the impact on women's emotional well-being who were awaiting results from IVF treatment[40].

### 3.7. The key components of intervention

Most interventions used CBT, ACT, and couples' therapy. CBT therapies that emphasize relaxation training, cognitive restructuring, emotional expression, and identifying negative beliefs might help phobic persons separate their worries from reality and alter their ways of thinking. Mindfulness meditation and mindfulness-based



**Table 4.** Description of the studies based on skill enhancement interventions.

Skill enhancement interventions	Author	Aim of the study	Components of intervention	Results
Positive reappraisal coping Intervention (PRCI)	Ockhuijsen <i>et al</i> , 2014	Impact of a self-administered coping intervention on emotional well-being in women awaiting the outcome of IVF treatment.	PRCI is a small card that contains ten positive reappraisal statements and a leaflet with a detailed explanation about this coping approach.	PCRI is a useful strategy for unpredictable and uncontrollable situations represented by a medical waiting period. Low cost self-help coping intervention increases positive affect during the waiting period in an IVF treatment.
Expressive writing intervention (EWI)	Matthiesen <i>et al</i> , 2011,	Reduce distress and improve pregnancy rates for couples undergoing ART treatment.	Writing about their deepest feelings & experience in relation to their involuntary childlessness.	EWI is feasible, cost-effective, and efficient method for alleviating infertility-related stress.

stress reduction were also adapted. Infertility stress, sexual issues, marital concerns, dysfunctional societal concerns, and rejection of a child-free lifestyle were addressed. MBCIST incorporated mindfulness meditation and cognitive therapy for infertile stress. One intervention had 10 sessions over a year, while another had 10 weeks of expert psychologist-led group sessions. Another study used 2-hour daily CBT for 10 days. Another infertile group received 6-month CBT[3,26,29,33–35].

ACT interventions focus on determined efforts to accept reality and neutralize unpleasant thoughts and feelings, addressing thoughts, feelings, strengths, and attentiveness. The intervention entails accepting issues rather than responding to them, the desire to deal with challenging events, daily desire for memories, regulating unpleasant emotions, determining behavior efficacy or inefficiency, and life values. One ACT intervention had eleven 90-minute sessions twice a week, while most had 8[20,21,25,32].

Couple therapy addressed marital problems and behavior. Behavior therapy, listening, communication skills, marital attribution, acceptable nonverbal and vocal behaviors, reinforcement-punishment, mutual interactions, and problem-solving skills were crucial components. Ten weekly 90-minute sessions were held[17], studying anxiety and stress with harp treatment. Harp was played for 20 minutes before the embryo was transferred or the regular treatment was administered. Intrinsic healing elements of live music and sound synchronize a patient's physiological rhythms to the harp music providing a healing environment and pregnancy rate increased[24].

Marital relationship counseling consisted of three 60- to 90-minute sessions per week. This study examined how marriage counseling affected infertile couples' relationships and sexual pleasure. Teaching communication, problem-solving, and sexual satisfaction were crucial[31]. The partnership and coping enhancement program (PCEP), based on the Preliminary Partnership and Coping Conceptual Framework, was a face-to-face, 90-minute group session for couples undergoing IVF that included couples counseling (P-PCCF). Psycho-education, experiential sharing, meditation, and

skill-based practice were the key tenets[36].

Integrative body-mind-spirit (I-BMS) sessions were given every week for four weeks before starting IVF treatment. The duration of the study was four years, and each meeting lasted three hours. Sixteen groups of seven to ten women in China who were all undergoing their first cycle of IVF participated in the study. Physical health, psychological well-being (including interpersonal and emotional relationship issues), and spiritual health were prioritized throughout the intervention, alongside intervention, ideas from Chinese ideologies, and traditional Chinese medicine[11].

Other psychological programmes included therapeutic counseling intervention mainly for self-esteem, depression, anxiety, stress reduction, and marital adjustment. They also included psychoeducation, breathing, mental relaxation exercises and sleep hygiene discussions[37]. Two researches named psychosocial and psychological interventions were based on CBT and supportive psychotherapy which was imparted by a clinical psychologist (individually).

One of the core themes of this CBT was the identification of negative thinking patterns that were getting in the way of the patient's ability to separate their phobia from reality. Physical activity (such as going for daily walks), muscle relaxation exercises, expressing feelings, eating a healthy, well-balanced diet, engaging in creative activities, and organizing leisure time according to personal interests were all employed as behavioral techniques[27,38].

This scoping research found four online infertility interventions owing to technological advancement. Most of the therapies used partially or moderately dynamic online activities. It included a 10-week one-on-one program that reduces discomfort and boosts fertility. The online intervention followed a structured theme similar to the one-on-one Mind/Body for Fertility session. Ten one-hour programs included knowledge and exercises. Each module employed a range of media for homework assignments[18].

Telegram, a smartphone social network that includes sexual activity, cleanliness, and health training, was utilized for frequent infertility counselling. After the intervention, participants received a training

file containing all materials. Open discourse about sexual identities and norms, mutual support, sexual satisfaction and communication, and shame reduction were vital elements of the intervention. This study investigated a brief online teaching and support program for infertile women. CBT and stress management were incorporated[39]. Female infertility patients were tested to determine the usefulness of a brief online teaching and support program. It taught cognitive behavioral skills and stress management[19].

31 Infertile women seeking medical reproductive technology received two weeks of web-based CBT. Web-based coping with infertility (CWI) exercises were based on clinically proven stress, anxiety, depression, grieving, and relationship stress interventions. Psychoeducation and skill-based strategies were applied, and a personalized coping strategy could be generated and downloaded on the internet to prevent and decrease the negative effects of infertility[29].

The skill enhancement intervention has distinct aspects as well. The primary component of the expressive writing intervention (EWI) included writing tasks that take 20 minutes and are done alone at home. Over three days, participants did three 20-minute EWI writing tasks regarding their deepest feelings and views about involuntary childlessness, IVF/intracytoplasmic sperm injection (ICSI) treatment for infertility, and positive attitudes about childlessness[23]. A self-administered coping intervention on emotional well-being in IVF-awaiting women was examined. Positive reappraisal coping intervention (PRCI) was a card with ten positive reappraisals and an explanation leaflet was distributed[40].

#### 4. Discussion

We were able to explore and systematically summarise a wide variety of infertility care strategies thanks to the scoping review technique. 25 Studies looked into infertility treatment interventions, with a wide range of interventions, outcomes measures, and results. The review suggests that psychosocial therapies should be given more attention to infertile couples. The multiple components of infertility treatment necessitated the development of obstetrics and psychosocial interventions. Psychological, social, educational, skill-building, and internet-based interventions were all utilized. The review findings helped us map the research field and identify gaps for future research and clinical practice for the effective design of psychosocial interventions. The implications of the review findings for the effective design of psychosocial interventions, including the content, format duration and tools used for intervention are discussed. The content of the interventions mainly focused on marital and sexual satisfaction, stress, anxiety, and quality of life and it helped to educate, and enhance mental wellness among infertile patients. Psychosocial interventions, internet interventions, and skill development interventions were categorized as infertility

interventions. Infertile couples and women were treated with ACT and CBT. This intervention enhanced mental health, sexual function, well-being, optimism, and quality of life[41,42]. CBT interventions included relaxation training, cognitive restructuring, emotional expression, recognition of negative thinking to help participants distinguish phobia from reality and modify their cognitive structure, mindfulness-based stress reduction, mindfulness meditation, domains of infertility stress, dysfunctional attitudes to social concerns, sexual concerns, marital concerns, and rejection of child-free lifestyle. Mindfulness-based cognitive infertility stress therapy and couples therapy, which included behaviour therapy, listening, communication skills, marital attribution, and acceptable nonverbal and vocal behaviours, were also successful in treating stress and marital disputes[13,14]. Psychosocial interventions including partnership and coping enhancement program (PCEP) and integrative body-mind-spirit (I-BMS) studies improved marital satisfaction, stress reduction, depression, self-esteem, and anxiety. With the rise of epidemics, online interventions are becoming more accessible and affordable. It reduced anguish, anxiety, relational stress, depression, and enhanced fertility. These interventions used strong ideas including mind-body intervention, CBT, psychoeducation, and online training packages[19,25,29]. Online interventions were cost-effective and widely accepted. Expressive writing intervention, communication, stress management, and coping skills programs benefited. These interventions suggest that developing these competencies reduces stress and increases pregnancy rates[23,28,40].

The face-to-face format of intervention can be suggested as the better option for infertility since it is a sensitive aspect of life and most of the therapies involve face-to-face engagements. The studies suggested that interventions should focus on couples, though women were found to have more issues than men, since partner support was important in coping with infertility. The duration of an intervention can be at least 45 minutes and should not extend beyond 90 minutes. Psychological interventions can enable infertile couples to address their psychosocial issues related to infertility, according to the review and can enable them to live with dignity. Each intervention was created after the target group assessment. The target population's requirements and problems may vary, but the therapist decides which intervention model will help participants succeed. Intervention strategies and session contents have been discussed with the participants. Sessions might last as little as a few minutes or as long as several hours. This highlights the significance of interventions for infertility.

The review identified certain gaps in research. Firstly, most studies included infertile women, though there were studies that included couples, there was no particular study that researched the impact of interventions on infertile men. This brings up the question of whether we can generalize the impact of interventions on men. The inclusion of both partners can benefit the outcome of the intervention as infertility cannot be treated as an individual problem

as it has a wide range of social and health repercussions[43]. The next question is what method may be used to truly quantify the impact of psychosocial intervention, given that all the research has employed different measures to analyse various elements of infertility therapies. Finally, the interventions were given at different phases of infertility, at different intervals, durations and using different therapies. This implies and points out the importance of the research gap in doing blinded RCTs with appropriate methodologies.

There are some implications for future research. The advancement of reproductive technology has given hope to thousands who aspire to have a child. The high-tech technologies have also brought in a lot of psychological, social and ethical issues that not only require medical help but also professional psychological help. The examined research studies suggest that providing infertile couples with access to psychosocial therapies can help them overcome their infertility issues. It is best if both partners are involved in the curriculum to help build a feeling of relationship and help infertile couples cope with this life crisis. The review suggests that infertile patients could benefit from several kinds of intervention. Infertile patients may find it easier to deal with the crisis if psychosocial interventions are initiated as soon as possible once the diagnosis is made. Longer sessions are very strenuous on the participants and should last no more than two hours each. It has been suggested that a team effort involving nurses and social workers can help infertile couples feel better. The effectiveness of psychological therapies can be confirmed through RCTs that compare interventions to standard care in clinical practice. This review has included sufficient RCTs to demonstrate the efficacy of psychosocial interventions in the management of infertility. Accessibility, affordability, availability and quality of interventions remain a challenge in the majority of the countries. Public health funding and policies are not prioritized in most countries like India for infertility interventions. The lack of adequate infrastructure, inappropriate management of resources including the human resources of professionals, lack of information and training, absence of clear protocols at all levels, preoccupation with other health issues and lack of regulation were all identified as weaknesses of infertility management in India[44]. Research has shown that these interventions have significant clinical implications for both psychological well-being and pregnancy outcomes in infertile couples[13]. Tailored psychosocial interventions for infertile couples have a multifaceted clinical impact on their mental health, marital function, and pregnancy outcomes. By addressing the emotional and psychological challenges associated with infertility, these interventions can significantly contribute to improving the overall quality of life for couples. While there are professionals who focus on the mental health of infertility, the topic of infertility health care is still mostly uncharted territory. To better serve infertile couples, clinics should be equipped with a standardized, effective design of psychosocial interventions that is sensitive to their cultural backgrounds.

The shortcomings and strengths of this scoping review must be considered. To begin, consider the risk of publication bias, which could imply that only research demonstrating a positive impact of interventions is published. Second, we only looked at studies on infertility-related therapeutic interventions. Scoping reviews are gaining popularity in challenging research fields like health, especially when the topic has not been thoroughly evaluated. To effectively map the landscape of psychosocial interventions in infertility care, the use of a scoping review appears to have been wholly appropriate. When researching a novel topic in the field of care, the first step is to conduct a scoping review.

In conclusion, the overall scoping review study summarises the research that has been done on interventions to better treat infertile patients. Couples' mental health, quality of marriage, and birth rates have all been found to improve after receiving psychosocial interventions. Yet, it is challenging to evaluate the overall effects on participants because different kinds of interventions have been employed in different studies. Both ACT and CBT are among the most frequently used therapies for these purposes. The popularity of online interventions is also on the rise. These interventions were complex in that they addressed a wide range of problems using different strategies. Standardized instruments were used to evaluate most therapies; the fertility quality of life and fertility problem inventories were particularly relevant because of their strong relationship to infertility. The interventions focused on marital and sexual satisfaction, stress, anxiety, and quality of life to educate and improve mental health in infertile patients. Because infertility is a delicate issue, face-to-face intervention might be the better option. The inclusion of both partners can benefit the outcome of the intervention as infertility cannot be treated as an individual problem. All the researchers point out that psychosocial interventions and therapies can have a positive effect on mental health and pregnancy outcomes for infertility. Anyone trying to figure out what areas of fertility-care practice could benefit more research or advancement will find this review especially helpful. Those trying to figure out what areas of fertility-care practice could benefit more from such interventions or research advancement will find this review highly attuned.

### **Conflict of interest statement**

The authors declare there is no conflict of interest.

### **Acknowledgements**

We would like to thank all our colleagues in Rajagiri College Research Center for their full cooperation and support on this study.



## Funding

This work was funded by University Grants Commission, India under the JRF (Junior Research Fellowship) scheme for Ph.D. Scholars.

## Authors' contributions

This study was prepared by Sreemol Sunil and Dr. Anish K.R. All authors have read the final manuscript, provided feedback and approved the final manuscript.

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