

The Effect of Mental Health Promotion Interventions on Depressive Symptoms in Infertile Men: A Systematic Review and a Necessity Requiring Attention

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Systematic Review

Keywords: Infertility, Men, Depression, Mental Health Promotion Interventions

Posted Date: June 10th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9645544/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Infertile men may experience depressive symptoms due to infertility itself and the lack of expressing their problems, which can negatively influence various aspects of their health and even their response to treatment. Mental health promotion interventions are among the most important interventions for supporting infertile men. The aim of this systematic review was to identify the interventions that can promote mental health of infertile men with respect to depressive symptoms.

Methods

This systematic review was conducted based on PRISMA guidelines. A comprehensive search without time restrictions was performed in English across international databases, such as PubMed, Web of Sciences, Scopus, and the Google scholar search engine, up to June 30, 2025. Mental health promotion interventions, depression, infertility, terms from the related MeSH repository and their synonyms were the related keywords, and controlled clinical trials that aimed to provide psychological interventions for depressive symptoms in infertile men were selected. To ensure comprehensive search, AND and OR operators were applied according to each database's specific search strategy. Search in the related databases was conducted independently by two researchers. The quality of the included studies was assessed using the CONSORT checklist.

Results

After removing duplicates, 2,058 articles remained from the initial 3,890 studies. Then, the title, abstract, and inclusion and exclusion criteria of the articles were evaluated and the full texts of 32 articles were reviewed. Finally, based on the research objectives, five articles were selected for the systematic review. Of the five included articles, three had employed Cognitive Behavioral Therapy (CBT), one examined the effects of Emotionally Focused Therapy (EFT), and one had used both Multicouple Group Intervention (MCG) and Single-Couple Intervention (SC). The results indicated that these interventions can effectively reduce depressive symptoms in men.

Discussion

This systematic review indicated that mental health promotion interventions can reduce depressive symptoms in infertile men. However, the limited number of studies in this area underscores the need for further research.

Introduction

Infertility is defined as the inability to conceive after one year of regular, unprotected sexual intercourse. Men account for 50% of infertilities, with testicular and post-testicular deficiencies, as well as endocrine-disrupting disorders, identified as the key causes of infertility in men (1). Although infertility impacts various aspects of a couple's life (2), its effects may be more pronounced in women (3). However, infertile men also experience significant changes, especially in psychological aspects of their lives (4, 5).

Infertile men are prone to experience psychological problems due to factors such as threats to masculinity, social stigma, and the financial burden of treatment (4, 6). Moreover, failing to express the problem and assuming only a supportive role in treatment (4, 7), further predisposes infertile men to psychological disorders, with depression prevalence reported as high as 23% (8). Additionally, psychological problems can negatively affect fertility outcomes (9–11). Depression can also negatively influence one's willingness to seek treatment (12). Given that male factors alone account for 20–30% of infertility cases and contribute to up to 50% of overall infertility (1), men's mental health needs to be considered more.

There exist different strategies for promoting mental health, primarily through counseling and educational interventions (13). Education increases awareness, promotes healthier lifestyles, improves overall well-being, and helps individuals adapt to challenges and problems (14). Through the transfer of information, education enhances motivation, builds skills and self-confidence, and lays the foundation for behavior change and adaptation (15).

A variety of interventions have been developed to promote mental health and reduce depression, including cognitive behavioral therapies and mind-body interventions (9, 16). Dong et al. (2024) reported in a study that mind-body exercises are effective in alleviating depression and anxiety (17). In another study, Reavell et al. (2018) demonstrated the effectiveness of cognitive behavioral therapy for treating depression in patients with cardiovascular disease (18). Faramarzi et al. (2008) reported that the results of cognitive behavioral therapy for treating depression in infertile women were comparable to those of drug treatment (19).

To optimize intervention use, it is important to identify the most effective intervention and define its role. In their systematic review, Yahyavi et al. (2023) examined interventions to promote mental health of infertile women. They found that cognitive behavioral therapies, mind-body interventions, and stress management skills were not only the most common interventions (13), but they also reduced depression effectively. Although Bardideh et al. (2024) have explored cognitive behavioral therapies and reported positive psychological effects in infertile men (20), no study has specifically examined the role of common mental health interventions in addressing depressive symptoms within this population. This systematic review aimed to identify effective interventions for promoting mental health and alleviating depressive symptoms in infertile men.

Methods

Search Strategy:

This systematic review was conducted according to the PRISMA 2020 guidelines (21) and is registered in PROSPERO under the registration number CRD420251051600. International databases, including PubMed, Web of Science, and Scopus, as well as the Google Scholar search engine, were systematically searched using MeSH terms and their synonyms. The search was conducted in English without time restrictions, up to June 30, 2025, and the specific search strategy for each database was applied accordingly. The search strategies used for the PubMed and Scopus databases are shown in Table 1.

Inclusion and exclusion criteria:

Inclusion criteria consisted of controlled clinical trials on infertile men (defined as inability to conceive after one year of unprotected intercourse). The selected interventional studies focused on depression in infertile men and employed standardized assessment tools for evaluating depressive symptoms.

Exclusion criteria included infertile men with mental or physical illness, those using psychiatric medications, lack of access to full text articles, studies published in languages other than English, non-interventional studies (review, case report, cross-sectional, etc.), and animal studies.

PICO:

In this study, P refers to the population of infertile men who have not conceived after one year of unprotected intercourse; I refer to interventions aimed at promoting mental health; C denotes the comparison between the control and intervention groups; and O represents the outcome (depression scores) measured using a valid and reliable instrument.

Outcome measures:

In a controlled clinical trial, the depression scores of infertile men were assessed before and after a mental health promotion intervention using a valid and reliable instrument.

Data Extraction:

Database searches were conducted independently by two trained researchers (ZK and MS), retrieved records were imported into EndNote, and duplicate articles were subsequently removed. Based on the inclusion criteria and the final outcome of the study, the titles and abstracts were assessed, and then, if necessary, the entire text of the article was fully reviewed by two trained reviewers (ZK and MS). Then, the results were reviewed in a face-to-face meeting, and inter-rater agreement was calculated, yielding a kappa

coefficient of $k = 1$. Data extraction was also performed independently by two trained reviewers (ZK and MS). Extracted information included the authors, year of publication, study location, sample size, type of infertility, mean age, duration of infertility, type of intervention, depression scores, and the instrument used to assess depression.

Quality assessment:

This assessment was conducted using the 2025 version of the Consolidated Standards of Reporting Trials (CONSORT) checklist. This checklist has 30 items on trial design, analysis, and interpretation (22). Scoring for the 30 items is categorized as: (1) Fully Reported, (2) Not Reported, or (3) Not Applicable (NA), where NA indicates that the item is not applicable to the specific trial. From the sum of the scores, the total quality assessment score is obtained, with higher scores indicating better quality. The assessment was independently conducted by two reviewers (ZK and MS). All articles received scores above 25, and the inter-rater agreement coefficient for quality assessment was $K = 0.97$.

Publication bias

The Cochrane Risk of Bias 2.0 (RoB 2) tool was used to assess publication bias. The RoB 2 tool assesses five main domains of bias: (1) bias arising from the randomization process, (2) bias due to deviations from intended interventions, (3) bias due to missing outcome data, (4) bias in measurement of the outcome, and (5) bias in selection of the reported result. Each domain includes a series of guiding questions, which are answered using standardized responses: "Yes," "No," "Probably no," and "No information." Based on the responses, each domain is rated as having "low risk of bias," "some concerns," or "high risk of bias." Finally, an overall judgment of the study's risk of bias is provided (23, 24). All studies were assessed and were found to be at low risk of bias. This assessment was conducted independently by two reviewers (ZK and MS) and the inter-rater agreement coefficient was $K = 1$.

Results

Out of the 3,890 initial articles, duplicate was eliminated and the titles and abstracts of the remaining articles were reviewed. After excluding the articles that did not align with the research objective and failed to meet the inclusion criteria and main outcome measures, the main text of 32 articles was reviewed and, finally, 5 articles were included in the study (Fig. 1).

Table 1. Results of the systematic section

No.	Authors	countries	Sample size	Mean years of infertility (mean ±SD)	intervention	Intervention time	Type of Tools	Depression (Mean± SD or prevalence)
1	Noorbala et al 2008 (25)	Iran	Group1: 144	-	Group1:	Before starting treatment and during treatment	BDI	Before:14.1
					CBT and supportive psychoth erapy			After:8.9
			Group2: 144		Group2:			Before:15.7
					CBT			After:18.3
2	Soltani et al 2013(26)	Iran	Experimental group:12	-	Experimental group:	Before starting infertility treatment	DASS	Before:11.75±2.56
					EFT			After:7.91±1.67
			Control group:12		Control group:			Before:11.00±2.55
					Routine care			After:11.25±3.46
3	Starabadi et al 2019(27)	Iran	Experimental group:15	-	Experimental group: CBT	Before starting infertility treatment	BDI	Before:29.66±6.12
								After:21.30±4.56
			Control group:15		Control group:			Before:29.93±5.10
					Routine care			After:29.56±5.63
4	Domar et al 2023(28)	USA	Experimental: group:19	Experimental group:2.7±1.8	Experimental group: CBT	Before starting infertility treatment	HADS	Before: 3.95 ± 2.97
								After: 3.95 ± 2.97
			Experimental group:19	Control group:2.3±0.9	Control group:			Before: 3.53 ± 2.41
					Routine care			After: 3.58 ± 2.87
5	Chamorro et al. 2023 (29)	Spain	MCG:42	-	Experimental group:	Before starting infertility treatment	BDI	MCG:
								Before:5.00±00
			SC:40		MCG and SC			MCG: After:4.8±2.1
								SC: Before: 5.4±1.2
			C:46					SC: After: 4.2±2.1
					Control group:			Before:5.00±00
					Routine care			After:5.00±00

Abbreviations: CBT: cognitive-behavioral therapy, EFT: the effect of emotionally focused therapy, MCG: Multicouple group intervention, SC: single-couple intervention, BDI: The Beck Depression Inventory, DASS: Depression, anxiety and stress scale, HADS: Hospital Anxiety and Depression Scale,

In this study, a total of 508 infertile men from randomized controlled trials were investigated in terms of the effects of psychological interventions on depressive symptoms in men. The limited number of studies in this area highlights a significant gap in the literature and the need for further investigation in this area. These five studies had used three different types of cognitive behavioral therapy (CBT) interventions, either alone or in combination with other supportive approaches, such as emotionally focused therapy (EFT), and both couple-based and group interventions. All studies had a control group, and in most of them the interventions effectively reduced depressive symptoms in infertile men. However, a critical point is the timing of these interventions, as their effectiveness appears to be greater before the start of infertility treatment (Table 1).

Type of Intervention

Of the five studies, three employed CBT, one used EET, and one both multicouple group (MCG) and single-couple (SC) interventions.

CBT interventions refer to a range of psychotherapeutic methods and techniques designed to modify negative and maladaptive patterns of thought and behavior, with the purpose of treating psychological conditions such as anxiety, depression, obsessive-compulsive disorder, and other mental health disorders. In the study by Noorbala et al. (25), CBT was taught in both intervention and control groups. In their study, the control group received only CBT for six months during infertility treatment, while the intervention group received CBT combined with supportive interventions for six months before the beginning of infertility treatment. The results indicated that CBT interventions combined with supportive interventions administered before the initiation of infertility treatment were significantly more effective than CBT alone during treatment in reducing depressive symptoms in infertile men ($p < 0.001$). In the study by Starabadi et al. (2019), the intervention and control groups received CBT and routine care, respectively, before the start of infertility treatment over the course of ten 90-minute sessions. The results showed that CBT was effective in reducing men's depression, and a significant difference was observed between the two groups (27) ($p < 0.0001$). Domar et al. (28) investigated the effects of a mobile application incorporating CBT techniques on depression and anxiety in men. The FertiStrong mobile application was designed to deliver cognitive-behavioral and relaxation-based coping strategies, with content developed by psychologists. Half of the interventions focused on strategies for managing the man's own distress, while the other half provided guidance on how to cope with his wife's distress. These strategies consisted of my partner, communication, pregnancy loss, work, social events, relationship survival, sexual intercourse, family and friends, medical aspects, mind/body and emotions, cognitive techniques, behavioral techniques, her/his needs, social solutions, and finding humor. These interventions were designed for 10 sessions before the initiation of infertility treatment, and the control group received routine care. Based on the results, there was a slight increase in the depression of the control group and the difference between the control and intervention groups was not significant ($P > 0.05$). However, the increase in stress levels was significantly higher in the control group ($p < 0.02$). In this study, the focus of the training was more on stress reduction than depression, which may explain the observed results.

In the study conducted by Soltani et al. (26), the intervention group received the effect of EFT in 10 sessions, and the following objectives were considered: first session) assessment; second session) discrete individual session with each of the couples; third session) identifying the communicative patterns; fourth session) reconstruction of couples' bond; fifth session) deepening affective conflicts of couples on the basis of attachment needs; sixth session) expanding self in relation with others; seventh session) activation; eighth session) finding new solutions for old problems; ninth session) the use of treatment benefits in daily life; and tenth session) ending.

The results showed that EET intervention could effectively reduce depressive symptoms in men, and a significant difference was observed between the two groups ($p < 0.0001$). In the study by Chamorro et al. (29), the intervention group was divided into two subgroups: MCG and S), while the control group received routine care. In both intervention subgroups, all participants took part in a six-session treatment program led by a psychologist who also served as the therapist and was a member of the research team. Sessions were held weekly or biweekly, and each session lasted for about 90 minutes. The intervention consisted of two programs: 1) A mind-body program that included cognitive restructuring, emotional expression, coping skills training, and participation in support groups; and 2) A group program for couples designed to improve communication, reduce stress, enhance coping with childlessness, and support infertility treatment. The only difference between the MCG and SC interventions was the implementation of interventions as single-couple and group intervention. The results indicated that the SC intervention was more effective than the group intervention in reducing depression among infertile men, and its effects were more sustained over time, with an effect size of $d = 0.207$. Although this difference was not statistically significant between the MCG and SC groups, both interventions reduced depressive symptoms compared to the control group.

Type of Tools

Three tools of the Beck Depression Inventory (BDI), the Hospital Anxiety and Depression Scale (HADS), and the Depression, anxiety, and stress scale (DASS) had been used in the studies to assess depression. Three studies had used the BDI, one used the HADS, and one used the DASS. The original version of the BDI was published in 1961, and a revised version (the BDI-II) was released in 1996 to better align with the updated criteria of the DSM-IV and to more effectively cover severe depressive symptoms (30). This tool consists of 21 items rated on a 4-point Likert scale ranging from 0 to 3, resulting in a total score of 0 to 63, with higher scores indicating greater levels of depression (31). Various studies have confirmed the validity and reliability the tool (31, 32).

Developed by Lovibond in 1995, the DASS consists of 21 items rated on a Likert scale from 0 to 3. The scale includes three subscales of depression, anxiety, and stress, with higher scores indicate greater severity of symptoms (33). The scale has been translated into multiple languages around the world and has demonstrated strong validity and reliability in various studies (34, 35).

The HADS is developed to assess anxiety and depression using 14 items (7 for each subscale) rated on a 4-point Likert scale ranging from 0 to 3. Each subscale yields a maximum score of 21, with higher scores indicating greater levels of anxiety or depression (36). The validity and reliability of the scale have been confirmed in different studies worldwide, establishing it as one of the most reliable scales for the assessment of anxiety and depression (37, 38).

Discussion

This systematic review examined the effect of mental health promotion interventions on depressive symptoms in infertile men. The results indicated that psychological interventions, such as CBT, EFT, MCG, and SC, can effectively reduce depressive symptoms in infertile men.

A systematic review and meta-analysis reported an overall depression prevalence of 18.3% among infertile men, which is relatively high in the general male population (8). This elevated prevalence may be attributed to the multifaceted impact of infertility on various health dimensions, leading to diverse negative outcomes (39). Studies on the psychological consequences of infertility in men indicate that infertility can negatively affect mental health by increasing depressive symptoms and reducing quality of life, with these effects being more pronounced in traditional societies (40).

Coping strategies such as seeking social support, expressing emotions, and redefining life goals, are defined as protective factors against depression. Talking openly about infertility and receiving support can help reduce depression (41). Moreover, a study of infertile men indicated that infertility treatment combined with the development of adaptive coping strategies improved mental health and enhanced treatment outcomes (39).

Mental health promotion interventions include a range of psychological, social, and educational methods and programs designed to improve mental health, enhance social skills and support, and prevent the onset of mental disorders (40). A variety of mental health promotion interventions have been shown to effectively reduce symptoms of depression. These psychological interventions encompass CBT, mind-body interventions (MBI), and stress management skills, etc (9). In our systematic review, interventions such as CBT, either alone or combined with other supportive approaches, EFT, and both couple- and group-based interventions were utilized, all of which contributed, in one way or another, to reducing depression in men. However, given the limited number of studies and the variety of interventions, it was not possible to make a precise comparison. In their systematic review, Yahyavi et al. (2023) examined interventions to promote mental health in infertile women. Based on the results of their study, CBT, MBIs, and stress management skills were the most commonly used approaches for promoting mental health in women (13). These results align with our findings.

CBT, a short-term, problem-focused form of psychotherapy, is based on the premise that an individual's thoughts and emotions significantly influence their behavior. In this approach, individuals learn to identify irrational and unrealistic thoughts, challenge them, and then replace them with rational thoughts (44). CBT can be a particularly effective therapeutic approach in the context of infertility, where individuals may experience irrational thoughts and feelings of inadequacy or deficiency (42). A 2023 meta-analysis examining infertile women found that CBT had a significant effect in reducing symptoms of depression in these women (43). Investigating the effect of CBT on infertile couples, Abdollahpour et al. (44) found that this method could effectively reduce depression of these couples .

In EFI, the type of psychotherapy focuses on the identification, acceptance, and regulation of emotions, with the goal of promoting mental health and well-being by cultivating positive emotions and correcting cognitive errors (43, 45). In a study by Najafi et al., EFI had positive effects on reducing depression in infertile couples and improved quality of life and marital relationships (46).

This study also used CBT and MBI methods in both group and couple-based interventions. MBI emphasizes the mind–body connection and incorporates techniques such as relaxation, deep breathing, meditation, biofeedback, and mindfulness, all of which have been shown to reduce depression (47). Hosseini et al. conducted a short-term MBI program for infertile women and found that the intervention could reduce depressive symptoms and improve their quality of life (48). In this study, the interventions were more

effective when delivered as couple-based approaches, which may partly explain why some infertile couples prefer to keep their struggles private and are reluctant to disclose them publicly.

Another key finding of this study is the timing of the intervention, which appears to be more effective when implemented before the initiation of treatment. Educational interventions enhance individuals' awareness and make them able to adapt to challenges (14). Through the transfer of information, education helps to calm individuals, lays the foundation for behavioral change and adaptation, and can prevent the emergence of psychological problems (15).

According to studies, the desire and expectation to become parents are similar in both women and men, with female and male factors contributing equally in this regard (49, 50). However, most research on psychological and supportive needs and interventions has primarily focused on women, with remarkably less attention given to infertile men. Thus, infertile men's experiences are often overlooked, and their problems remain unaddressed (51). Moreover, mental health promotion interventions should be multidimensional, incorporating education, social support, psychological techniques, and lifestyle modifications to effectively enhance individuals' mental well-being and prevent the onset of mental disorders (52).

Conclusion

Mental health promotion interventions can effectively reduce depressive symptoms in infertile men. However, the limited number of studies in this area highlights the need for further research to strengthen the evidence base. It is recommended that policymakers place greater emphasis on the mental health of infertile men, encouraging each country to develop culturally appropriate intervention strategies to improve the mental health of infertile couples. Moreover, these interventions should be integrated as a standard component of care in both public and private healthcare settings.

Limitations of the Study

This study is limited by the inability to review the articles written in languages other than English that may have employed alternative methods effective in improving the psychological state of infertile men, as well as by the lack of access to the full texts of some relevant articles. Other limitations of our study included the limited number of studies in this area, the diversity of interventions, and the diversity of depression assessment tools, which made meta-analysis impossible.

Strengths

This study is among the first studies conducted in this area to focus exclusively on men, and its findings help to highlight and address the specific needs of these men more effectively. Policymakers can use the results of this study for planning and policymaking to develop appropriate interventions aimed at improving the health of infertile men. These interventions can be implemented in both public and private infertility centers.

Abbreviations

CBT
cognitive-behavioral therapy
EFT
the effect of emotionally focused therapy
MCG
Multicouple group intervention
SC
single-couple intervention
BDI
The Beck Depression Inventory
DASS
Depression, anxiety and stress scale
HADS
Hospital Anxiety and Depression Scale
RoB 2

Declarations

Ethics approval and consent to participate

The study was approved by the ethics committee, Faculty of Pharmacy and Nursing Midwifery, Shahid Beheshti University of Medical Sciences, with the code "IR.SBMU.PHARMACY.REC.1404.038". All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no conflict of interest.

Funding

Not declared.

Author Contribution

MS, ZK, and FR developed the project and designed the concept and study. RT, SH and ZK contributed to the study design and managed data analysis. MS, FR, SH, RT and ZK prepared the first and revised drafts of the manuscript, edited critically the manuscript. All authors have read and approved the manuscript as well as have agreed on the final manuscript and all tables.

Acknowledgment

The authors would like to express their gratitude and thank to the cooperation and assistance of the officials of faculty, library and computer ward at Shahid Beheshti University of Medical Sciences.

Data Availability

All data related to this review is included in the result section of the manuscript. If any further data is needed it can be accessible via the corresponding author (Zahra Kiani) on request.

Clinical trial number: not applicable

References

1. Vander Borgh M, Wyns C. Fertility and infertility: Definition and epidemiology. Clin Biochem. 2018;62:2–10.
2. Goker A, Yanikkerem E, Birge O, Kuscu NK. Quality of life in Turkish infertile couples and related factors. Hum Fertility. 2018;21(3):195–203.
3. Naginevičiūtė M, Misiukaitė U, Blaževičienė A. Quality of life of infertile men and women. Nursing education, research, & practice: NERP Kaunas: Lietuvos sveikatos mokslų universitetas. 2021;11.

4. Dooley M, Nolan A, Sarma K. The psychological impact of male factor infertility and fertility treatment on men: a qualitative study. *Ir J Psychol.* 2011;32(1–2):14–24.
5. Kiani Z, Simbar M, Rashidi F, Zayeri F, Banaderakhsh H. The quality of life of men experiencing infertility: a systematic review. *BMC Public Health.* 2024;24(1):1236.
6. Abdullahzadeh M, Vanaki Z, Mohammadi E, Mohtashami J. Exploring men's struggles with infertility: A qualitative content analysis. *J Adv Nurs.* 2024;80(5):2018–26.
7. Cousineau TM, Domar AD. Psychological impact of infertility. *Best Pract Res Clin Obstet Gynecol.* 2007;21(2):293–308.
8. Kiani Z, Fakari FR, Hakimzadeh A, Hajian S, Fakari FR, Nasiri M. Prevalence of depression in infertile men: a systematic review and meta-analysis. *BMC Public Health.* 2023;23(1):1972.
9. Dube L, Bright K, Hayden KA, Gordon JL. Efficacy of psychological interventions for mental health and pregnancy rates among individuals with infertility: a systematic review and meta-analysis. *Hum Reprod Update.* 2023;29(1):71–94.
10. Quant HS, Zapantis A, Nihsen M, Bevilacqua K, Jindal S, Pal L. Reproductive implications of psychological distress for couples undergoing IVF. *J Assist Reprod Genet.* 2013;30(11):1451–8.
11. Simionescu G, Doroftei B, Maftai R, Obreja B-E, Anton E, Grab D, et al. The complex relationship between infertility and psychological distress. *Experimental Therapeutic Med.* 2021;21(4):306.
12. Herbert DL, Lucke JC, Dobson AJ. Depression: an emotional obstacle to seeking medical advice for infertility. *Fertil Steril.* 2010;94(5):1817–21.
13. Koochaksaraei FY, Simbar M, Khoshnoodifar M, Faramarzi M, Nasiri M. Interventions promoting mental health dimensions in infertile women: a systematic review. *BMC Psychol.* 2023;11(1):254.
14. Kaya Y, Beji NK, Aydin Y, Hassa H. The effect of health-promoting lifestyle education on the treatment of unexplained female infertility. *Eur J Obstet Gynecol Reproductive Biology.* 2016;207:109–14.
15. Shahbazi A, Behboodi Moghadam Z, Maasoumi R, Saffari M, Mohammadi S, Montazeri A. Effect of a health-education program based on the BASNEF model of overall sexual health satisfaction and satisfaction with quality of sexual relationship among women with infertility. *Int J Women's Health.* 2020:975–82.
16. 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):581–6.
17. Dong Y, Zhang X, Zhao R, Cao L, Kuang X, Yao J. The effects of mind-body exercise on anxiety and depression in older adults: a systematic review and network meta-analysis. *Front Psychiatry.* 2024;15:1305295.
18. Reavell J, Hopkinson M, Clarkesmith D, Lane DA. Effectiveness of cognitive behavioral therapy for depression and anxiety in patients with cardiovascular disease: a systematic review and meta-analysis. *Biopsychosoc Sci Med.* 2018;80(8):742–53.
19. Faramarzi M, Alipor A, Esmaelzadeh S, Kheirkhah F, Poladi K, Pash H. Treatment of depression and anxiety in infertile women: cognitive behavioral therapy versus fluoxetine. *J Affect Disord.* 2008;108(1–2):159–64.
20. Bardideh K, Jarareh J, Bardideh F, Bardideh A, Mofrad M. The effectiveness of cognitive-behavioural group therapy on infertile men, a randomised clinical trial. *J Reproductive Infant Psychol.* 2024;42(4):581–94.
21. Parums DV. Review articles, systematic reviews, meta-analysis, and the updated preferred reporting items for systematic reviews and meta-analyses (PRISMA) 2020 guidelines. *Med Sci monitor: Int Med J experimental Clin Res.* 2021;27:e934475–1.
22. Hopewell S, Chan A-W, Collins GS, Hróbjartsson A, Moher D, Schulz KF, et al. CONSORT 2025 statement: updated guideline for reporting randomised trials. *Lancet.* 2025;405(10489):1633–40.
23. Martimbianco ALC, Sá KMM, Santos GM, Santos EM, Pacheco RL, Riera R. Most Cochrane systematic reviews and protocols did not adhere to the Cochrane's risk of bias 2.0 tool. *Revista da Associação Médica Brasileira.* 2023;69:469–72.
24. Eldridge S, Campbell M, Campbell M, Dahota A, Giraudeau B, Higgins J et al. Revised Cochrane risk of bias tool for randomized trials (RoB 2.0): additional considerations for cluster-randomized trials. *Cochrane Methods Cochrane Database Syst Rev.* 2016;10(suppl 1).
25. Noorbala AA, Ramazanzadeh F, Malekafzali H, Abedinia N, Forooshani AR, Shariat M, et al. Effects of a psychological intervention on depression in infertile couples. *Int J Gynecol Obstet.* 2008;101(3):248–52.
26. Soltani M, Shairi MR, Roshan R, Rahimi CR. The impact of emotionally focused therapy on emotional distress in infertile couples. *Int J fertility Steril.* 2013;7(4):337.

27. Starabadi M, Amirfakhraei A, Keramati K, Samavi A. Efficacy of cognitive-behavioral therapy (CBT) on the infertility stress and depression in the infertile couples. *Med J mashhad Univ Med Sci*. 2019;61(6):3127–36.
28. Domar AD, Jasulaitis L, Matevossian K, Jasulaitis S, Grill EA, Meike LU. The Impact of the FertiStrong Mobile Application on Anxiety and Depression in Men: A Randomised Control Pilot Study. *J Hum reproductive Sci*. 2023;16(3):195–203.
29. Chamorro PP, Pino MJ, Casas-Rosal JC, Herruzo J. A longitudinal comparative study of a multicouple group and single-couple psychosocial intervention while experiencing infertility. *Fam Process*. 2023;62(2):557–75.
30. Richter P, Werner J, Heerlein A, Kraus A, Sauer H. On the validity of the Beck Depression Inventory: A review. *Psychopathology*. 1998;31(3):160–8.
31. Wang Y-P, Gorenstein C. Psychometric properties of the Beck Depression Inventory-II: a comprehensive review. *Revista brasileira de psiquiatria*. 2013;35(4):416–31.
32. Kühner C, Bürger C, Keller F, Hautzinger M. Reliability and validity of the revised Beck Depression Inventory (BDI-II). Results from German samples. *Nervenarzt*. 2007;78(6):651–6.
33. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther*. 1995;33(3):335–43.
34. Ramli M, Salmiah M, Nurul Ain M. Validation and psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS) among diabetic patients. *Malaysian J Psychiatry*. 2009;18(2):40–5.
35. Yusoff MSB. Psychometric properties of the depression anxiety stress scale in a sample of medical degree applicants. *Int Med J*. 2013;20(3):295–300.
36. Rishi P, Rishi E, Maitray A, Agarwal A, Nair S, Gopalakrishnan S. Hospital anxiety and depression scale assessment of 100 patients before and after using low vision care: A prospective study in a tertiary eye-care setting. *Indian J Ophthalmol*. 2017;65(11):1203–8.
37. Michopoulos I, Douzenis A, Kalkavoura C, Christodoulou C, Michalopoulou P, Kalemi G, et al. Hospital Anxiety and Depression Scale (HADS): validation in a Greek general hospital sample. *Ann Gen Psychiatry*. 2008;7(1):4.
38. Montazeri A, Vahdaninia M, Ebrahimi M, Jarvandi S. The Hospital Anxiety and Depression Scale (HADS): translation and validation study of the Iranian version. *Health Qual Life Outcomes*. 2003;1(1):14.
39. Szatmári A, Helembai K, Zádori J, Dudás I, Eva, Fejes Z, Drótos G, et al. Adaptive coping strategies in male infertility, paramedical counselling as a way of support. *J Reproductive Infant Psychol*. 2021;39(5):457–74.
40. Amaro P, Fonseca C, Pereira A, Afonso A, Barros ML, Serra I, et al. Mental health-promoting intervention models in university students: a systematic review and meta-analysis protocol. *BMJ open*. 2025;15(3):e091297.
41. Shahraki Z, Afshari M, Ghajarzadeh M, Tanha FD. How different are men with infertility-related problems from fertile men in prevalence of Depression, anxiety and quality of life? *Maedica*. 2019;14(1):26.
42. Biggs SN, Halliday J, Hammarberg K. Psychological consequences of a diagnosis of infertility in men: a systematic analysis. *Asian J Androl*. 2024;26(1):10–9.
43. Wang G, Liu X, Lei J. Cognitive behavioural therapy for women with infertility: A systematic review and meta-analysis. *Clin Psychol Psychother*. 2023;30(1):38–53.
44. Abdollahpour S, Taghipour A, Mousavi Vahed SH, Latifnejad Roudsari R. The efficacy of cognitive behavioural therapy on stress, anxiety and depression of infertile couples: a systematic review and meta-analysis. *J Obstet Gynaecol*. 2022;42(2):188–97.
45. Greenman PS, Johnson SM. Emotionally focused therapy: Attachment, connection, and health. *Curr Opin Psychol*. 2022;43:146–50.
46. Najafi M, Soleimani AA, Ahmadi K, Javidi N, Kamkar EH. The effectiveness of emotionally focused therapy on enhancing marital adjustment and quality of life among infertile couples with marital conflicts. *Int J fertility Steril*. 2015;9(2):238.
47. Psaros C, Kagan L, Shifren JL, Willett J, Jacquart J, Alert MD, et al. Mind–body group treatment for women coping with infertility: a pilot study. *J Psychosom Obstet Gynecol*. 2015;36(2):75–83.
48. Hosseini MS, Mousavi P, Hekmat K, Haghighyzadeh MH, Fard RJ, Jafari RM. Effects of a short-term mindfulness-based stress reduction program on the quality of life of women with infertility: a randomized controlled clinical trial. *Complement Ther Med*. 2020;50:102403.

49. Hammarberg K, Baker H, Fisher J. Men's experiences of infertility and infertility treatment 5 years after diagnosis of male factor infertility: a retrospective cohort study. *Hum Reprod.* 2010;25(11):2815–20.

50. Hanna E, Gough B. Experiencing male infertility: A review of the qualitative research literature. *Sage Open.* 2015;5(4):2158244015610319.

51. Duffy J, Adamson G, Benson E, Bhattacharya S, Bofill M, Brian K, et al. Top 10 priorities for future infertility research: an international consensus development study. *Fertil Steril.* 2021;115(1):180–90.

52. Herman H, Jané-Llopis E. Mental health promotion in public health. *Promot Educ.* 2005;12(2suppl):42–7.

Table

Table 1 is available in the Supplementary Files section.

Figures

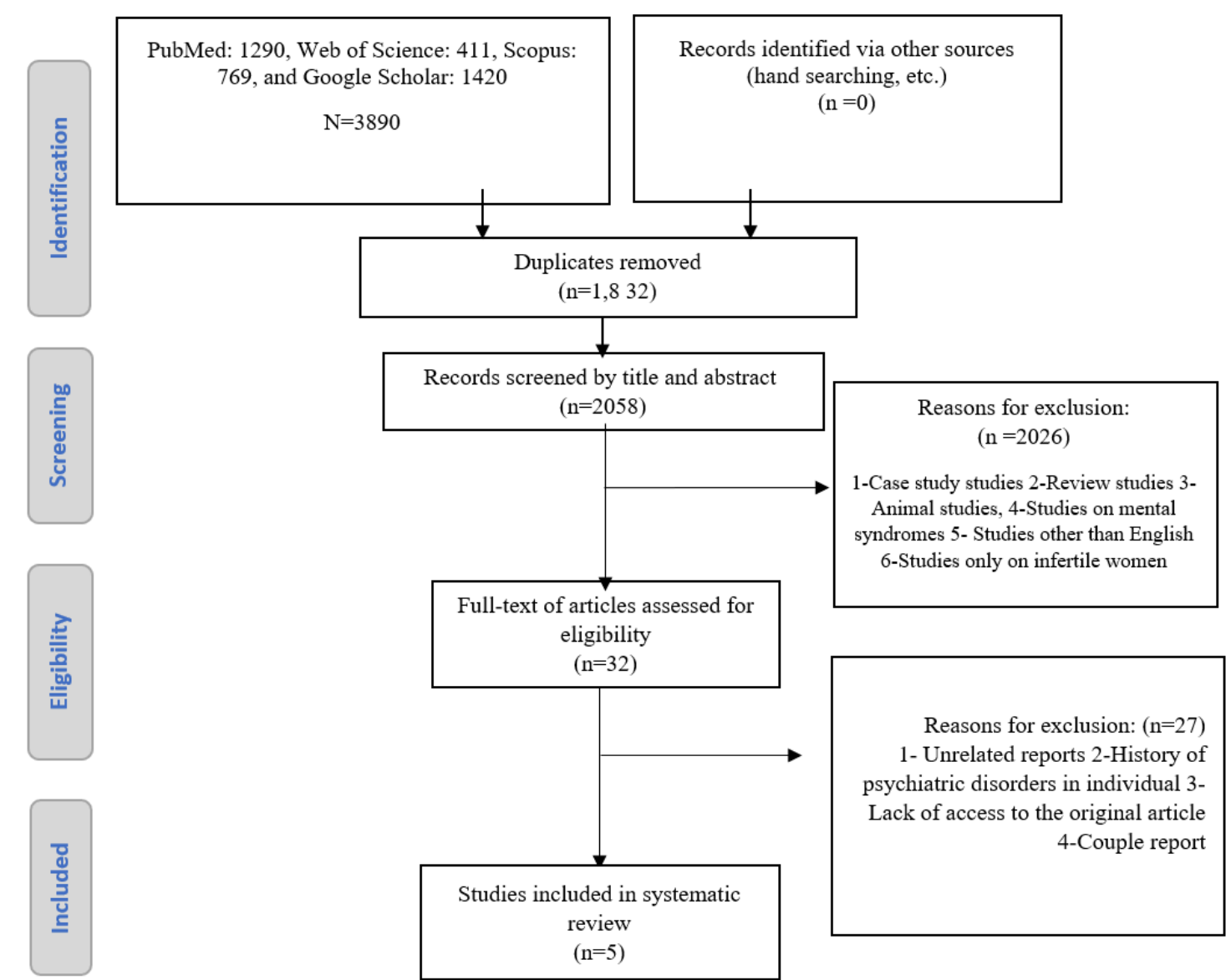


Figure 1

Flowchart for selection of studies

Supplementary Files

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- [Table1.docx](#)