

Mindfulness improves the mental health of infertile women: A systematic review

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Abstract

Infertility in women causes mental health problems, the bad ones. Women with infertility need psychological treatment using mindfulness interventions. This study's purpose was to analyze mindfulness's effect on the mental health of women with infertility through a systematic review. The method used in this systematic review was by searching through the following databases; ProQuest database, Wiley Library, Pubmed, Scopus, Science Direct, Sage Journal, Cochrane Library, and Cambridge Core from January 2011 to December 2021. Nine articles met the inclusion criteria. Results show that the use of mindfulness was found to be effective in reducing mental disorders in women with infertility. Nine articles that meet the criteria for inclusion. According to a study on the effects of mindfulness on infertile women, affect increasing mental health levels by reducing mental health disorder scores. Mindfulness has been proven to be an effective intervention for women undergoing infertility-related mental disorders such as stress, anxiety, and depression. However, different types of mindfulness-based interventions are used to target different mental health issues. For example, Mindfulness-Based Stress Reduction (MBSR) targets stress and anxiety while Mindfulness-Based Cognitive Therapy (MBCT) targets depression. Additionally, specific mindfulness for example, for the midwifery profession can be developed to improve the quality and treatment outcomes of healthcare for women struggling with infertility problems.

Keywords

Mindfulness, mental health, infertile women

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Introduction

Infertility is a condition in the reproductive system that fails in pregnancy after 12 months or more of marriage and having regular sexual intercourse without contraception¹ Infertility is one of the most significant global health problems² affecting both men and women of reproductive age worldwide. World data show that 48,000,000 couples and 186,000,000 people live with infertility.² A systematic review and meta-analysis resulted in 12,241 unique records for which 133 studies met the criteria for systematic review. There were 65 and 69 studies that provided lifetime prevalence and 12-month period infertility prevalence data, respectively.³ Infertility has a negative impact that causes mental health problems and psychological disturbances.⁴ Infertility problems affect mental health ranging from 25% to 60% of sufferers worldwide.⁵ The prevalence of depression or mental health problems among

infertile or infertile women is 28.03% in high-income countries and 44.32% in low- and middle-income countries.⁶ They suffered from mental health such as stress, anxiety, depression, frustration, identity disorder, a lack of attractiveness, sexual satisfaction, and dysfunction.⁷ Psychological stress is often seen as a natural result of infertility that appears in the form of acute or chronic stressors.⁸ Several studies have shown that mental health factors can threaten the outcome of infertility treatment.⁹ Several interventions can be done to improve mental

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health and quality of life in people with infertility, namely yoga training, therapy, and psychological counseling.^{10,11}

Mindfulness encompasses the key therapeutic concepts of acceptance, compassion, and detachment.¹² Mindfulness-based stress reduction is a non-pharmacological intervention that is rooted in the religious tradition of Buddhism and is used as a behavioral intervention in clinical problems. Jon Kabat Zinn uses MBSR to treat chronic pain, increase one's acceptance of the phenomenon. MBSR teaches one to be present in the present moment without worrying about the future and past events.¹³ The most common types used in mindfulness interventions are Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT).¹⁴ MBCT is given as a weekly group treatment program for 8 weeks.¹⁵ Each weekly session lasts 2 h, it is also necessary to complete 45 min of homework assignments 6 days a week. For homework, participants listened to audio recordings and practiced mindfulness meditation. The treatment given in each session is different.¹⁶

Mindfulness was found to be effective in reducing psychological distresses such as stress¹⁷ and anxiety¹⁸ chronic pain, and social anxiety disorder,¹⁹ can help infertile or infertile women to cope with their problems in an adaptive way.²⁰ The results of previous literature studies show that *mindfulness* has a very significant effect on mental health and meditation and is a therapeutic modality that has been investigated for its effects on overcoming chronic pain.

Materials and methods

This systematic review was aimed at exploring the impacts of mindfulness intervention on the mental health of women with problems of infertility. Data were identified from 2011 to December 2021 with 927 participants. The search was conducted through the ProQuest database, Wiley Library, Pubmed, Scopus, Science Direct, Sage journal, Cochrane Library, and Cambridge Core with the use of keywords Mindfulness AND Mental health AND Women with infertility.

The selection of the study was made by choosing relevant titles and abstracts that were conducted directly by the researcher. Then the screening was carried out based on the inclusion criteria, namely: original research journals published from 2011 to 2021, with a female population with infertility, with the use of mindfulness interventions, and journals in English (Figure 1).

Result

ProQuest database, Wiley Library, Pubmed, Scopus, Science Direct, Sage journal, Cochrane Library, and Cambridge core found a total of nine articles that matched the keywords, nine articles that were free of duplication,

according to theme title and fulltext article. Filtering This study was conducted to determine articles that fit the inclusion criteria.

Nine articles met the criteria with a total of 927 female respondents with infertility including studies using Randomized controlled trial design, Clinical Trial, Randomized Clinical Trial, and Experiment. Studies that met the criteria discussed the application of mindfulness to improve the mental health of a woman with infertility.

The process begins with searching for articles through keywords in several databases. A search conducted on the Proquest database found 186 articles related to the search keyword, namely mental health in infertile women who received mindfulness therapy. One hundred sixty-one articles were found from a search conducted in the Wiley Library database, 3 articles were found through a search using the Scopus database, 9 articles were found using PubMed, 11 articles were found in the ScienceDirect database, 316 articles were found in the Sage Journal database, 26 articles were found through the Cochrane Library database, 587 articles found via the Cambridge core database. After going through the search process through keywords, a total of 1299 articles were collected. Then screening of articles based on titles and abstracts obtained 298 articles by removing 38 articles that were not appropriate based on titles and abstracts.

A feasibility assessment was carried out with 260 articles obtained by sorting according to the exclusion criteria, namely by considering the theme of the article, which does not match the theme. There were 205 free articles, 3 paid journals, and 2 articles that are not full text making it 210 articles identified that there were 9 articles that met the exclusion and inclusion criteria.

The writings obtained will then be carried out a feasibility assessment and obtained 260 articles, be sorted according to the exclusion criteria, namely by considering the theme of the article, which does not match the theme, there are 205 articles, as many as 3 paid journals, and 2 articles that are not full text. So there are 210 articles issued. So it was found that there were 9 articles that met the exclusion and inclusion criteria.

From the 9 articles, the population is 615 population which was separated into a control group and an intervention group. The treatment team received the Mindfulness treatment using several different types of Mindfulness and at different times. While the control group is a group of infertile women who did not receive mindfulness intervention.

The results of this treatment explain that Mindfulness has a major effect on the mental health of women with infertility. Infertile women who tend to experience stress decreased their stress levels after receiving this intervention. Likewise with levels of anxiety and depression.

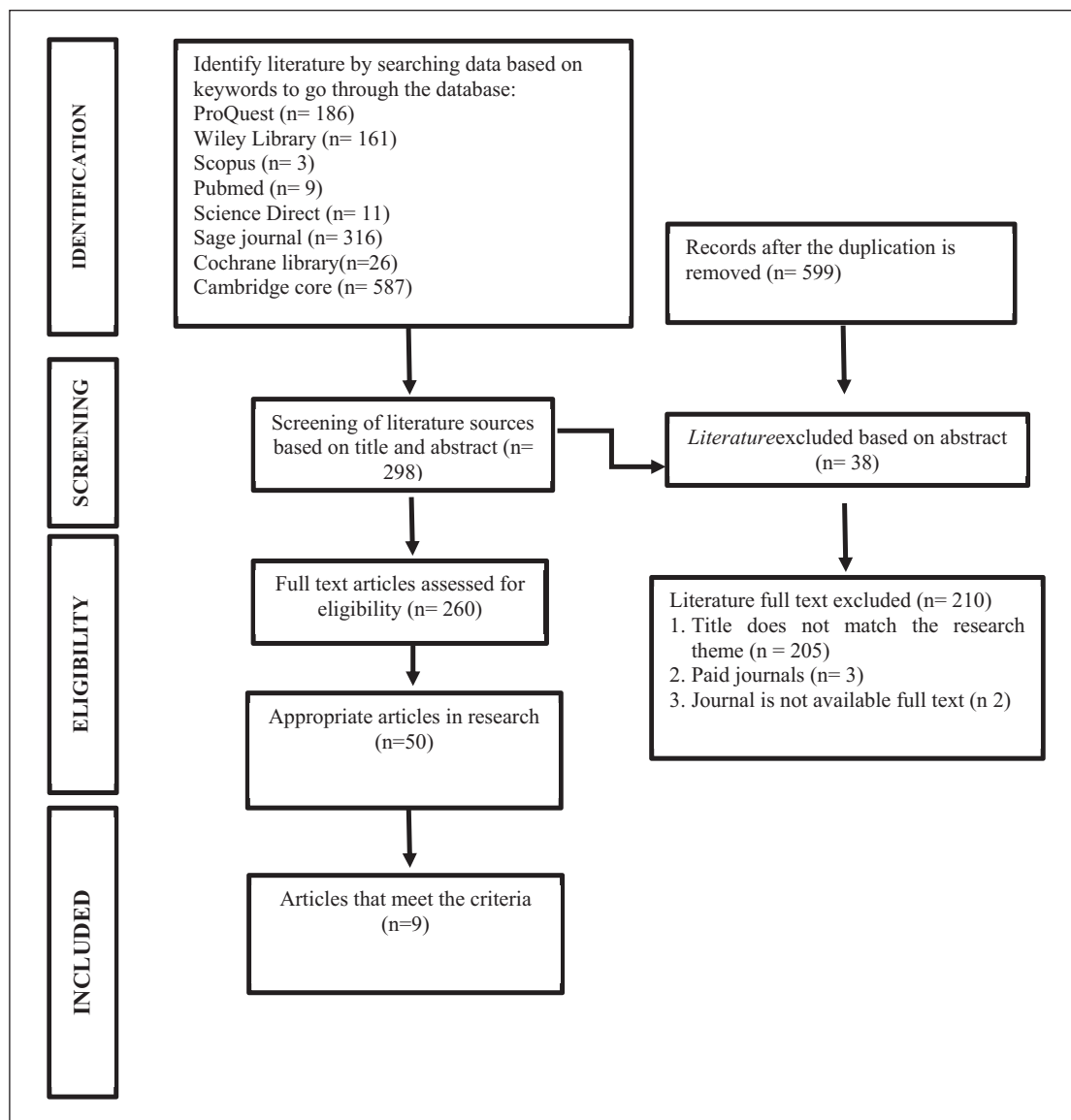


Figure 1. Flow chart selection articles for systematic review.

As is the case with research conducted in Iran in 2015, it was explained that Mindfulness can improve the mental health level of infertile women with a score after the intervention of 59.3 and 50.9 before treatment. In addition, a study of infertile women who received a mindfulness intervention conducted in Brazil resulted that mindfulness can reduce stress levels, with the pretest results of 23.6 and a post-test of 1.6 this shows a very significant decrease.⁹

In reducing anxiety, it was also seen in a study conducted in Portugal with a pre-test score of 47.8 and a post-test score of 43.03.²¹ Likewise, other studies also explain that mindfulness has an effect on improving mental health by reducing mental health problems such as depression. This is shown in a study conducted in Iran by producing a pretest score of 20.77 and a post-test score of 10.82 (Table 1).²²

Discussion

Based on nine articles that discuss the effect of mindfulness on the quality of life in women with infertility. Articles that discuss mindfulness and health consist of several countries, namely Iran, Portugal, Brazil, and India. Results analysis of nine articles this report that effective mindfulness in raising level mental health with reducing problem health mentally.⁹

A mental health problem that often occurs in women with infertility is stress.²³ This is reinforced by a study conducted in India conducted on 300 infertile women that stress levels reached 80%²⁴ Stress is defined as the reaction that people may have when faced with demands and pressures that do not match their knowledge and abilities and that challenge their ability to cope.²⁵ Infertile women

Table 1. Result articles.

Number	Title	Author (year), Country	Research methods	Population	Mindfulness intervention (type, duration, session length)	Research instruments	Database	Results
	The effectiveness of mindfulness-based cognitive group therapy on marital satisfaction and general health in women with infertility	Abedi Najimeh et al. Iran (2015)	Randomized control trial (RCT)	n: All infertile women who visited Ali Abi Taleb Hospital in Zahedan City in 2014 n: 60 infertile women Experiment: (n = 30) Control: (n = 30) x age: infertile women aged 29–37 years	Type: Mindfulness-based cognitive therapy (MBCT). Duration: 120 min/week Sessions: eight sessions	General health questionnaire (GHQ-28)	Pubmed	MBCT is effective in reducing infertility-related psychological problems and will result in high mental health scores ($p < 0.05$) Pretest: 50.9 Posttest: 59.3
	Effects of a short-term mindfulness-based stress reduction program on the quality of life of women with infertility: a randomized controlled clinical trial	Masoumeh Sadat et al. Iran (2020)	Randomized controlled clinical trial	n: 89 Women with infertility n: 36 Women with infertility who meet the criteria Experiment: (n = 18) control: (n = 18)	Mindfulness-based stress reduction (MBSR). Duration: 120 min Session: 8 weeks	Short form health survey (SF-36)	Science direct	The short-term MBSR program was effective in improving the quality of life scores of infertile women ($p < 0.001$) Pretest: 22.8 Posttest: 58 And can significantly improve mental health ($P < 0.001$). Pretest: 22.7 Posttest: 58
	Effect of mindfulness-Based group counseling on depression in infertile women: randomized clinical trial study	Kalhorri Fatemeh et al. Iran (2020)	Clinical trial	n: 120 Women with infertility undergoing IVF treatment n: 90 Willing infertile women Experiment: (n = 45) control: (n = 45) x age: 25–40 years old	Mindfulness-based cognitive therapy (MBCT). Duration: 120 min/week Sessions: eight sessions	Beck depression inventory II (BDI-II)	Proquest	Decreased depression symptom score significant (48%) ($p < 0.001$). Mindfulness-based group counseling can reduce symptoms of depression in infertile women.
	Effects of a short-term mindfulness-based stress reduction program on the quality of life of women with infertility: a randomized controlled clinical trial	Masoumeh Sadat et al. Iran (2020)	Randomized controlled clinical trial	n: 89 Women with infertility n: 36 Women with infertility who meet the criteria Experiment: (n = 18) control: (n = 18)	Mindfulness-based stress reduction (MBSR). Duration: 120 min Session: 8 weeks	Short form health survey (SF-36)	Science direct	The short-term MBSR program was effective in improving the quality of life scores of infertile women ($p < 0.001$) Pretest: 38 Posttest: 62.9 And can significantly improve mental health ($P < 0.001$). Pretest: 22.7 Posttest: 58
	Comparing the effectiveness of the unified protocol transdiagnostic and mindfulness-based stress reduction program on anxiety and depression in infertile women receiving in vitro fertilization	Elnaz Mousavi et al. Iran (2019)	Randomized control trial (RCT)	n: 45 Women with infertility n: 30 Women with infertility who meet the criteria Experiment: (n = 15) control: (n = 15) x age: around 25–45 years old	Mindfulness-based stress reduction (MBSR). Duration: 120 min Session: 3 months	1. Beck depression inventory (BDI-II) 2. Structural clinical interview for DSM (SCID) 3. Beck anxiety inventory (BAI)	Pubmed	MBSR can reduce anxiety and depression rates and increase awareness. The effectiveness of MBSR for anxiety disorders and depression. ^{35,36} Decreased anxiety and depression scores Worry Pretest: 34 Post-test: 25 Follow up:24 Depression Pretest: 27 Post-test: 24 Follow-up:23

(Continued)

Table 1. (Continued)

Number	Title	Author (year), Country	Research methods	Population	Mindfulness intervention (type, duration, session length)	Research instruments	Database	Results
	The Effects of mindfulness-based stress reduction group therapy on anxiety, depression, stress, and the intolerance of uncertainty in infertile women	Mousavi Elnaz et al. Iran (2020)	Randomized clinical trial	n: 55 Women with infertility who were referred to Taleghani Hospital n: 30 Women with infertility who meet the criteria Experiment: (n = 15) control: (n = 15) x̄ age: around 20–45 years old	Mindfulness-based stress reduction (MBSR) Duration: 120 min/week Session length: 8 sessions	1. Depression anxiety stress scale-21 (DASS-21) 2. Structured clinical interview for DSM-IV Axis I disorders (SCID-I) 3. The structured clinical interview for DSM-IV axis II disorders (SCID-II)	Scopus	MBSR affects depression and stress reduction in women with infertile (p < 0.001) Stress Pre: 7.2 Posts: 5 Depression Pre: 15 Posts: 10 Anxiety worry posts: 10 MBPI is effective in infertile women in improving mental health and reducing levels of depression and anxiety. Depression Pretest: 11.02 Posttest: 6.18 Worry Pretest: 47.6 Posttest: 43 MBP is proven as one of the interventions that have an effect on reducing stress levels (p < 0.01) and depression so as to improve general well-being (p < 0.01) for infertile women.
	Mindfulness-based program for infertility: an efficacy study	Galhardo Ana Portugal (2013)	Controlled clinical trial	n: 102 Infertile women Experiment: (n = 55) control: (n = 37)	Mindfulness-based program for infertility (MBPI) Duration: 120 min/week Sessions: 10 sessions	1. Beck depression inventory (BDI) 2. State anxiety inventory form Y (STAI-Y1) 3. Infertility self-efficacy scale (ISE) 4. Freiburg mindfulness inventory (FMI)	Proquest	MBPI is effective in infertile women in improving mental health and reducing levels of depression and anxiety. Depression Pretest: 11.02 Posttest: 6.18 Worry Pretest: 47.6 Posttest: 43 MBP is proven as one of the interventions that have an effect on reducing stress levels (p < 0.01) and depression so as to improve general well-being (p < 0.01) for infertile women.
	Mindfulness-based program for stress reduction in infertility women: randomized controlled trial	Nery Simone Brazil (2018)	Randomized control trial (RCT)	n: 178 Infertile women n: 178 Infertile women The experimental group (n = 97) Control group (n = 81) x̄ age : 18–50 years old	Mindfulness-based program (MBP) Duration: 120 min/week u Session Length: Ten weeks	1. Stress lipp inventory (SSL) 2. Beck depression inventory (BDI-21) 3. Psychological general well-being (PGWBI)	Wiley	MBP is proven as one of the interventions that have an effect on reducing stress levels (p < 0.01) and depression so as to improve general well-being (p < 0.01) for infertile women.
	Mindfulness therapy in reducing stress and anxiety among women with infertility	Dhyani Manisha India (2013)	Experiment	n: 100 Women with infertility Experiment: (n = 50) control: (n = 50) x̄ age : 21–30 years old	Mindfulness-based controlled therapy (MBCT)	1. Perceived stress scale (PSC) 2. Hamilton anxiety scale (HAM)	Science direct	There was a significant reduction in levels of stress ($t_{(98)} = 8.29$) and anxiety ($t_{(98)} = 12.83$) in women with infertility after being given the mindfulness intervention. Stress level Pretest: 53.3% moderate stress Posttest: 60% low stress Anxiety level Pretest: 80% moderately anxious Posttest: 86.6% mild anxiety

experience greater stress than fertile women²⁶ Infertility stress occurs in a group of symptoms that appear when a person is diagnosed with infertility²⁴ Stress occurs in the symptoms of post-traumatic stress disorder and is associated with thoughts and feelings.²⁷

Reducing stress levels to improve mental health can use a variety of interventions.²⁸ One of the interventions used is mindfulness. The type of mindfulness most often used to reduce stress levels is MBSR²⁹ with a session length of 8 weeks and a duration of 120 min.³⁰ The benefits of MBSR, people better recognize their own strengths and weaknesses, learn strategies of coping, commitment, and acceptance, help them move forward to achieve goals, accept their mistakes and decisions without judgment, and quickly identify stressful events, which in turn reduces stress and anxiety before they become depressed.³¹ This therapy consists of courses of 2.5 h/week, 8 weeks with a 1-day retreat.³² Participants received training in formal mindfulness meditation techniques involving simple stretching and postures³³

Infertile women are more susceptible to mental anxiety disorders than fertile women.⁶ Anxiety is manifested by disturbances in mood, as well as thought, behavior, and physiological activity.³⁴ Forms of anxiety can be in the form of disturbances in sleep, concentration, and social or occupational functioning.^{35–37} Anxiety is associated with restlessness, tension or restlessness, easily tired, difficulty concentrating or mind going blank, irritability, and muscle tension³⁵

Mindfulness has been shown to reduce anxiety levels in infertile women quite well.³⁸ Mindfulness is effective in reducing anxiety levels in infertile women up to 76%.³⁹ Mindfulness interventions that are used to reduce anxiety can use all types of mindfulness, and the most effective is to use of the MBSR type⁴⁰ The first session was about introducing an automatic guidance system or knowing how to use current awareness through the body, mind, and emotional sensations in reducing stress, in addition to practicing eating raisins and breathing exercises for 1–3 min⁴¹ In the second session, reviewing body exercises or providing feedback and discussions on studying body exercises or breathing-based mindfulness meditation.⁴² The third session is practicing mindfulness-based sitting with mindful breathing/yoga exercises/3 min of breathing exercises.⁴³ The fourth session reviews the body practice or mindfulness yoga practice for 5 min, practicing seeing and hearing, retraining the mindfulness session with mindfulness of breathing and body. The fifth session, practicing breathing, retraining awareness session, explaining stress and identifying participants' reactions to stress, checking awareness of pleasant and unpleasant situations regarding feelings, thoughts, and body sensations/ practicing mindful yoga practice/practicing breathing for 3 min, and distributing pamphlets about mindfulness. In the sixth session practiced mindfulness yoga, practicing sitting meditation, and distributing

pamphlets.⁴⁴ In the seventh session, practicing mountain meditation, discussing sleep problems, repeating the previous session's exercises or practicing some fun activities, and distributing flyers for the seventh session⁴⁵

A study that describes the effectiveness of mindfulness in reducing anxiety levels in women with infertility reported that mindfulness can be used as a therapeutic option or appropriate intervention to reduce anxiety levels.²⁶

In addition to discussing forms of mental health disorders, stress, and anxiety, it also discusses depression. Depression is a feeling of a bad mood that lasts a long time and affects daily life⁴⁶ prenatal anxiety and depression, which are emotional disorders characterized by mood instability and decreased interest in activities.^{47,48} Infertile women are susceptible to depression due to infertility treatment that takes a long time,⁴⁹ so it has an impact on prolonged emotional conditions that color the process of thinking, feeling, and behaving. In addition, symptoms of depression are also associated with distorted thoughts about yourself, such as blaming yourself and seeing yourself as worthless.^{49,50}

The article reports that mindfulness interventions are very effective in reducing depression rates in infertile women. Mindfulness can significantly reduce depression levels.^{9,21,22,51} Mindfulness has been successful in reducing depression rates by up to 48%.²² Mindfulness can affect how the brain processes emotions under stress, shift activation in some regions of the prefrontal cortex from right-sided activation to left-sided activation in more excellent emotional balance, and induce a positive immune system.⁵² Mindfulness shows activation in the network in the cerebral cortex involved in the experience people who **do not** practice mindfulness show less activation in this area.⁵³ Mindfulness-based interventions can effectively reduce symptoms of anxiety and depression.⁵⁴

Conclusion

Mindfulness interventions have an effect on mental health in women with infertility. Mindfulness interventions can improve mental health by reducing mental health problems such as stress, anxiety, and depression while using different types of *mindfulness* has another significance for each style. MBSR is effective for infertile women with stress and anxiety disorders, while the kind of *mindfulness* effective for reducing depression is MBCT.

Mindfulness in the future can be used as one of the selected intervention options to improve and strengthen mental and psychological health in women with infertility by reducing mental health problems.

Declaration of conflicting interests

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