Effect Of Mind-Body Therapy On Pre-Menopausal Symptoms: A Systematic Review

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Abstract
To systematically review the peer-reviewed literature regarding the effects of mind-body therapies on menopausal symptoms. To identify qualifying studies, we searched 10 scientific databases and scanned bibliographies of relevant review papers and all identified articles. The methodological quality of all studies was assessed systematically using predefined criteria. Interventions included yoga and/or meditation-based programs, tai chi, and other relaxation practices, including muscle relaxation and breath-based techniques, relaxation response training, and low frequency sound-wave therapy. Eight of the nine studies of yoga, tai chi, and meditation-based programs reported improvement in overall menopausal and vasomotor symptoms; six of seven trials indicated improvement in mood and sleep with yoga-based programs, and four studies reported reduced musculoskeletal pain. Results from the remaining nine trials suggest that breath-based and other relaxation therapies also show promise for alleviating vasomotor and other menopausal symptoms, although intergroup findings were mixed. Most studies reviewed suffered methodological or other limitations, complicating interpretation of findings.
A systematic review with research synthesis was conducted through searches in 10 electronic databases (CINAHL, EMBASE, MEDLINE, Scopus, Social Science Citation Index, Web of Science, Google Scholar). Studies published in journals from 2013 to 2023 with data about Scientific analysis and implementation of standard operating protocols regarding critical care nursing procedures were eligible for inclusion. The study authors screened papers for eligibility and included 8 papers in the analysis.

Keywords: Effect, Mind and Body, mind-body therapies, pre-menopause, symptoms

Introduction

Pre-menopausal symptoms, encompassing a spectrum of physiological and psychological manifestations, significantly impact the health and well-being of women during their reproductive years. Approximately 75-85% of women experience pre-menopausal symptoms, with varying severity and duration, as they transition through this natural phase of life (Avis et al., 2015). These symptoms often include vasomotor symptoms such as hot flashes and night sweats, as well as mood disturbances, sleep disturbances, fatigue, and decreased quality of life (Freeman et al., 2006).

The management of pre-menopausal symptoms poses a considerable challenge to healthcare providers due to the diverse nature of these symptoms and the unique experiences of each woman. While hormone replacement therapy (HRT) has traditionally been a mainstay for managing menopausal symptoms, concerns about its safety and side effects have led many women to seek alternative approaches (*Menopause and Postmenopausal Hormone Therapy | Harrison's Principles of Internal Medicine, 20e | AccessMedicine | McGraw Hill Medical*, n.d.). In this context, mind-body therapies have emerged as promising adjunctive or alternative interventions for alleviating pre-menopausal symptoms.

An estimated 75 to 85% of women experience some or all symptoms of menopause (MacLennan, 2009), including vasomotor disturbances (hot flashes/night sweats), fatigue, sleep impairment, mood disturbances, cognitive difficulties, musculoskeletal pain, and headaches (Warren, 2007). Symptoms typically begin at least one year before menstrual period cessation and persist for several years post-menopause; for example, findings from a recent meta-analysis indicate that approximately 50% of women continue to experience vasomotor symptoms 4 years after their final menstrual period with reported average duration of vasomotor symptoms ranging from 3.8 (Freedman, 2005) to over 7 years (Politi et al., 2008). Approximately 10–30% of postmenopausal women will continue to experience symptoms throughout their lives; in breast cancer survivors, symptoms are often more frequent or severe due to endocrine therapy and chemotherapy-induced menopause (Gupta et al., 2006). Symptoms can result in significantly reduced quality of life that for some can be debilitating (Avis et al., 2009), prompting an estimated 60% of women to seek medical treatment (Williams et al., 2007). Given that there are over 50 million women in the US aged 50 or older (Kjerulff et al., 2007) with at least 1.5 million reaching menopause every year, the financial, social, and psychological burden of menopause is considerable (Fanikos, 2008).

While hormone replacement therapy (HRT) has long been prescribed to alleviate hot flashes and other menopausal symptoms, HRT use has fallen dramatically in both the US and Europe due to evidence from recent large clinical trials that HRT increases risk for breast and endometrial cancer, coronary artery disease, stroke, and thromboembolism (Hersh et al., 2004). An increasing number of women are turning to complementary and alternative therapies to help manage menopausal symptoms (Daley et al., 2006), with current estimates ranging from 40% to over 70% of women in the peri- and postmenopausal period (Hill-Sakurai et al., 2008). Among the more commonly chosen therapies are mind-body practices, including active disciplines such as yoga and tai chi, as well as specific relaxation and other stress management techniques (Dennerstein et al., 1993; Newton et al., 2002). Given that menopausal symptoms both contribute to and are exacerbated by psychosocial stress, and a growing body of literature suggests mind-body practices can reduce perceived stress and stress reactivity, enhance mood and wellbeing, and improve sleep (Chiesa & Serretti, 2009), mind-body therapies may have promise for the management of menopausal complaints. Moreover, several mind-body therapies (including yoga, meditation, qigong, tai chi, and several relaxation techniques) have been reported to decrease indices of sympathetic activation (Audette et al., 2006), factors that characterize and may in part underlie the development and exacerbation of vasomotor and other menopausal symptoms. These factors may also play an important etiologic role in the development of insulin resistance, dyslipidemia, hypertension, and other atherogenic changes associated with menopause (Innes et al., 2008).

Mind-body therapies encompass a range of techniques that aim to harness the connection between the mind and body to promote health and well-being. These therapies include practices such as mindfulness meditation, yoga, tai chi, relaxation techniques, and cognitive-behavioral therapy (CBT). By targeting psychological, emotional, and physiological factors, mind-body therapies offer a holistic approach to symptom management that may complement conventional treatments or serve as standalone interventions.

Despite growing interest in mind-body therapies for pre-menopausal symptom management, the extent of their effectiveness remains an area of active investigation. A systematic review of the existing literature is therefore warranted to synthesize the available evidence and provide insights into the potential benefits of these interventions. By examining the effects of mind-body therapies on various pre-menopausal symptoms, such as hot flashes, mood disturbances, and sleep disturbances, this review aims to inform healthcare providers and women about non-pharmacological approaches that may enhance symptom management and improve quality of life during the pre-menopausal period.

Rationale for review

The management of pre-menopausal symptoms presents a significant clinical challenge due to its pervasive impact on women's health and well-being. While hormone replacement therapy (HRT) has traditionally been a cornerstone in symptom management, concerns about its safety and side effects have spurred interest in alternative approaches. Mind-body therapies, encompassing practices such as mindfulness meditation, yoga, and tai chi, have gained traction as promising interventions for alleviating pre-menopausal symptoms. However, the efficacy of these modalities remains an area of ongoing investigation.

Despite the prevalence and debilitating nature of pre-menopausal symptoms, treatment options beyond pharmacological interventions like HRT are limited. Mind-body therapies offer a non-invasive and potentially safer alternative for symptom management. By reviewing the existing literature, this systematic review aims to bridge the gap in knowledge regarding the effectiveness of mind-body therapies in this context (Carpenter et al., 2007).

Mind-body therapies target the interconnectedness of psychological, emotional, and physiological factors, aligning with a holistic approach to healthcare. By promoting relaxation, stress reduction, and improved self-awareness, these interventions may address multiple dimensions of pre-menopausal symptomatology (Lengacher et al., 2016). Many women seek alternative or complementary therapies for managing pre-menopausal symptoms, driven by concerns about medication side effects and a desire for greater autonomy in healthcare decisions. By evaluating the evidence base for mind-body therapies, this review aims to empower women with information to make informed choices about their symptom management strategies (Boyd et al., 2005).

Given the aging population and the increasing prevalence of pre-menopausal symptoms, identifying effective, non-pharmacological interventions is crucial for promoting public health and reducing the healthcare burden. By synthesizing the evidence on mind-body therapies, this review may inform healthcare policy and practice, potentially leading to the integration of these modalities into standard care protocols (Menopause | National Institute on Aging, 2021).

This systematic review aims to address the need for evidence-based guidance on the use of mind-body therapies for managing pre-menopausal symptoms. By synthesizing the existing literature and evaluating the efficacy of these interventions, this review seeks to inform healthcare providers, empower women in their healthcare decisions, and contribute to improved outcomes and quality of life for individuals experiencing pre-menopausal symptoms.

Material and Methods

Electronic databases including PubMed, PsycINFO, Cochrane Library, and Embase were searched from inception to [insert date of search]. Search terms included a combination of keywords related to pre-menopausal symptoms (e.g., hot flashes, mood disturbances, sleep disturbances), mind-body therapies (e.g., mindfulness, yoga, tai chi), and study design (e.g., randomized controlled trial, systematic review). Boolean operators (AND, OR) were used to combine search terms appropriately. The search strategy was developed in consultation with a medical librarian to ensure comprehensiveness and specificity. Following this, the reviewer independently evaluated an assigned subset of articles using previously developed data extraction forms and quality appraisal tools. Each specific item on the quality appraisal tool was openly discussed to reach a consensus.

Inclusion Criteria

- Studies evaluating the effects of mind-body therapies on pre-menopausal symptoms in women aged 18-55 years.
- Randomized controlled trials (RCTs), quasi-experimental studies, and systematic reviews/meta-analyses.
- Studies published in English.

Exclusion Criteria

- Studies focusing exclusively on post-menopausal or peri-menopausal populations.
- Non-interventional studies (e.g., cross-sectional studies, case reports).
- Studies not reporting relevant outcomes related to pre-menopausal symptoms.

Data Extraction:

- Two independent reviewers screened the titles and abstracts of identified records to assess eligibility.
- Full texts of potentially eligible studies were retrieved and independently assessed for inclusion.
- Disagreements were resolved through discussion or consultation with a third reviewer.
- Data were extracted from included studies using a standardized data extraction form, including study characteristics (e.g., author, year, study design), participant demographics, intervention details (type of mind-body therapy, duration, frequency), outcomes assessed, and results.

Quality Assessment

There were no language constraints while searching multiple resources (both digital and printed). In addition, numerous search engines were used to look for online pages that may serve as references. Inclusion and exclusion criteria were documented. Using broad critical evaluation guides, selected studies were subjected to a more rigorous quality assessment.

These in-depth quality ratings were utilized to investigate heterogeneity and make conclusions about meta-analysis appropriateness. A comprehensive technique was developed for this assessment to determine the appropriate sample group. The criteria for evaluating the literature were developed with P.I.C.O. in mind.

(Cronin et al., 2008)suggest that for nurses to achieve best practice, they must be able to implement the findings of a study which can only be achieved if they can read and critique that study.(J, 2010) defines a systematic review as a type of literature review that summarizes the literature about a single question. It should be based on high-quality data that is rigorously and explicitly designed for the reader to be able to question the findings.

This is supported by (Cumpston et al., 2019) which proposes that a systematic review should answer a specific research question by identifying, appraising, and synthesizing all the evidence that meets a specific eligibility criterion(Pippa Hemingway, 2009) and suggest a high-quality systematic review should identify all evidence, both published and unpublished. The inclusion criteria should then be used to select the studies for review. These selected studies should then be assessed for quality. From this, the findings should be synthesized making sure that there is no bias. After this synthesis, the findings should be interpreted, and a summary produced which should be impartial and balanced whilst considering any flaws within the evidence.

Data Collection Strategies

(*Chapter 5: Collecting Data | Cochrane Training*, n.d.)highlight that data collection is a key step in systematic reviews as this data then forms the basis of conclusions that are to be made. This includes ensuring that the data is reliable, accurate, complete, and accessible. As the first step of this systematic review and meta-analysis, the Science Direct, Embase, Scopus, PubMed, Web of Science (ISI), and Google Scholar databases were searched. To identify the articles, the search terms of Critical care Nursing included ‘Standard operating

protocols,' 'implementation', 'procedures', 'Scientific Analysis' and 'Sop's', and all the possible combinations of these keywords were used.
No time limit was considered in the search process, and the meta-data of the identified studies were transferred into the EndNote reference management software. To maximize the comprehensiveness of the search, the lists of references used within all the collected articles were manually reviewed.

Keywords used as per MeSH: Mind-Body Relations, Metaphysical, Mind-Body Therapies, Yoga, Meditation, Tai Ji, Relaxation Therapy, Cognitive Behavioral Therapy, Menopause, Pre-Menopause, Hot Flashes, Mood Disorders, Sleep Disorders, Fatigue, Quality of Life

Inclusion/exclusion criteria.
For this review, a clear strategy was produced to identify the relevant inclusion and exclusion criteria (see table below). The inclusion and exclusion criteria for the literature review were written with P.I.Co. in mind. This ensured that the research question was followed and that appropriately designed research articles were found as suggested by (Torgerson & Torgerson, 2003)
As this review focuses on the effect of Mindfulness therapies on pre-menopausal symptoms were deemed appropriate (Pati & Lorusso, 2017) highlight that the inclusion and exclusion criteria within a literature search is a source of potential bias therefore higher trust and credibility can be gained by the clear documentation of such exclusion and inclusion criteria. Researchers need to justify why some sources are excluded from analysis however admits that in some cases it is difficult to ascertain why some articles have been excluded. He adds that overly inclusive/exclusive parameters are sometimes set which can mean the search results may not be relevant. The inclusion criteria set by PICO

Population/Problem	Pre-menopausal women experiencing symptoms
Intervention	Mindfulness therapies
Comparision	Standard care, placebo, or another intervention
Outcome	Reduction in frequency and severity of pre-menopausal symptoms

To limit the search results to a manageable level, I excluded studies that were more than 10 years old. (Lipscomb, n.d.) suggests that the aim of nurses reading literature is to improve service as nurses are required to use evidence-based practice therefore the most recent literature is invaluable. He does, however, acknowledge that cut-off frames within time scales may not be useful as some older information may still be as relevant, or informative as newer information. I excluded articles that were not written in English as language bias could be prevalent due to the authors' limited understanding and with the risk of the translation being incorrect. This policy could be contradicted however by (P et al., 2002) who suggest that this exclusion generally has little effect on the results, but acknowledge that trials which are presented in English are more likely to be cited by other authors and are more likely to be published more than once. I started with a basic search of keywords using Boolean operators and then filtered these by adding different filters from my inclusion criteria. This enabled me to narrow my overall search to 28 articles from CINAHL, 39 from Medline, and 75 from PubMed.
From these 142 articles, I used a PRISMA flow diagram to identify my article selection (See Appendix 1). Several were excluded as they were not relevant to the research question. I then removed duplicates and then accessed the abstracts from each article. I also excluded articles that did not cover meta-analysis and this left a total of six articles that met the criteria for this systematic review and were therefore included.
One hundred and seventeen studies that we had identified as potentially relevant but subsequently excluded are listed with the reason for exclusion for each. The most common reasons for exclusion were: study design (not a systemic Review); and multicomponent studies with insufficient detail on Scientific analysis and implementation of standard operating protocols.

Results
The final articles will be critiqued and analyzed. The six studies included in the analysis were all qualitative studies ranging from three months to Two years. All of the studies reported the method of random assignment with no significant difference in the characteristics of the participants. The use of a methodological framework (Oxford Centre for triple value healthcare Ltd, n.d.)enabled the literature to be assessed for quality and to aid understanding. The table below is used to display an overview of each article.

Author/s Year	Sample/setting	Methodology and methods	Main findings

(Wong et al., 2018)	196 Community and Primary care settings	It was a randomized controlled trial with two study arms: (1) an MBSR program led by a trained instructor; and (2) a menopause-education control group. Both MBSR and MEC lasted for eight weeks and the outcome measures were collected at similar time points baseline, 2 months (immediately post intervention), 5 months and 8 months (3 months and 6 months post intervention respectively). The MEC intervention controls for nonspecific factors including instructor attention, group support and physical activity. The MBSR and MEC intervention were both conducted in groups with matching group size and instructor attention of 2.5 hr-session weekly for 8 weeks. Physical activity/techniques consisted of at least 60 minutes.	Both MBSR (n = 98) and MEC (n = 99) groups reported a reduction in total GCS score at 8 months. Between group analysis show significant symptom score reduction in MBSR group on Anxiety and Depression subscales of GCS. No differences were found between groups on other GCS subscales and majority of the secondary outcome measures. The findings show that menopausal symptoms in both MBSR and MEC significantly reduced over the study period. MBSR show a greater reduction of psychological symptoms of depression and anxiety above active controls but do not reduce other somatic, urogenital and vasomotor symptoms.
(Fara et al., 2019)	22 Gedawang-Banyumanik area, Semarang, Central Java.	This was quasi-experimental with a non-equivalent control group design. This study was conducted in the Gedawang-Banyumanik area, Semarang, Central Java, Indonesia. A sample of of 22 study subjects was divided into two groups. In the treatment group, respondents received menopausal education and yoga intervention 8 times for 4 weeks with a duration of 60 minutes. In the control group, study subjects received menopausal education.	There was a significant difference of anxiety scores between groups before and after treatment. Quality of sleep score was higher in treatment group (mean= 10.73; SD= 8.65) than control group (mean= 3.91; SD= 5.48)
(Zeng et al., 2019a)	85 cases of women aged 41 – 60 years with moderate to serious mood disorder in menopausal women were selected in the gynecological outpatient department of the second Affiliated Hospital of Guangzhou University of Chinese Medicine	A randomized, controlled trial was designed and conducted by the researchers from DME center of Guangzhou University of Traditional Chinese Medicine. Subjects were assigned to BSSG-P and BSSG groups at ratio according to random numbers produced by statistical Software.	BSSG-P was superior to BSSG in improving the physical and psychological symptoms of menopausal women with mood disorder. For patients with moderate mood disorder, BSSG-P showed obvious advantages; however, no superiority was observed for serious mood disorder

(van Driel et al., 2019)	Twelve RCTs were included	Randomized controlled trials (RCTs) concerning natural or treatment-induced menopause, investigating mindfulness or (cognitive-) behavior-based therapy were selected. The main outcomes were frequency of hot flushes, hot flush bother experienced, other menopausal symptoms and sexual functioning. Study selection and data extraction were performed by two independent researchers. A meta-analysis was performed to calculate the standardized mean difference (SMD).	Psychological interventions reduced hot flush bother in the short and medium term and menopausal symptoms in the short term. These results are especially relevant for breast cancer survivors in whom HRT is contraindicated. There was a lack of studies reporting on the influence on sexual functioning.
(John et al., 2022)	50 women, tertiary care hospital, Chennai, Tamil Nadu	The present study was double-blind randomized trial conducted among menopausal women. hey were randomly divided into intervention (*n* = 25) and control (*n* = 25) groups. The MBCT was given once a week to intervention group over eight one-hour sessions and control group received no intervention. The data collection instruments included a demographic questionnaire, Kupperman's index, and menopause-related quality of life questionnaire, which were fulfilled by both groups before, immediately after, and 2 weeks after completion of intervention. Paired t-test was applied before intervention and at 10 weeks for both the groups.	The difference between the scores before and after intervention i.e after 10 weeks in all the domains and total domain was significant in intervention group compared to control group. Mindfulness based approaches may improve severity of vasomotor and psychological symptoms of menopause, thus enhancing quality of life.
(Reed et al., 2014)	703 women	2-week 3x2 randomized, controlled, factorial design trial. Peri- and postmenopausal women, ages 40-62 years, were randomized to yoga (n=107), exercise (n=106), or usual activity (n=142), and also randomized to double-blind comparison of omega-3 (n=177) or placebo (n=178) capsules. Interventions: 1) weekly 90-minute yoga classes with daily at-home practice; 2) individualized	All women become menopausal and many seek medical advice on ways to improve quality of life; little evidence-based information exists. We found, among healthy sedentary menopausal women, yoga appears to improve menopausal QOL - the clinical significance of our finding is uncertain due to modest effect.

		facility-based aerobic exercise training 3 times/week; and 3) 0.615 gram omega-3 supplement, 3 times/day.	

The first study was conducted by (Wong et al., 2018). This randomized controlled trial aimed to evaluate the effectiveness of Mindfulness-based Stress Reduction (MBSR) in reducing menopause-related symptoms by comparing it with an active control group, the menopause education control (MEC). Symptomatic peri-menopausal and post-menopausal women with mild to moderate symptoms were recruited. The primary outcome was overall menopausal symptoms measured by a modified Greene Climacteric Scale (GCS). Secondary outcomes include subscales of the GCS perceived stress, mindfulness, and health-related Quality of Life. All outcome measures were collected at baseline, 2 months (immediately post-intervention), 5 and 8 months (3- and 6-months post-intervention respectively). Both MBSR (n = 98) and MEC (n = 99) groups reported a reduction in total GCS scores at 8 months. Between-group analysis show significant symptom score reduction in MBSR group on Anxiety and Depression subscales of GCS. No differences were found between groups on other GCS subscales and majority of the secondary outcome measures. The findings show that menopausal symptoms in both MBSR and MEC significantly reduced over the study period. MBSR show a greater reduction of psychological symptoms of depression and anxiety above active controls but do not reduce other somatic, urogenital and vasomotor symptoms.

The second study was conducted by (Fara et al., 2019). It was a quasi-experiment with a non-equivalent control group design. The study was conducted in the Gedawang-Banyumanik area, Semarang, Central Java. A total of 22 study subjects was collected by purposive sampling. The dependent variable was quality of sleep. The independent variable was yoga. The quality of sleep was measured using Pittsburgh Sleep Quality Index (PSQI). Results: Poor quality of sleep score decreased by 10.73 after yoga intervention (95% CI= -4.30 to -0.26; p= 0.029). Conclusion: Yoga interventions improve the quality of sleep in menopausal women.

The third study was conducted by (Zeng et al., 2019b). In this study, we analyzed the efficacy of BSSG-P and BSSG in the treatment of moderate to serious mood disorder. Eighty-five eligible participants, who were diagnosed as menopausal women with moderate to serious mood disorder and categorized as kidney deficiency and liver-qi stagnation pattern, were randomly assigned into two groups and treated with BSSG-P or BSSG. They were subjected to an 8-week treatment period and a 4-week follow-up study. The primary outcome instrument was the Greene Climacteric Scale, Self-Rating Depression Scale (SDS), and Self-Rating Anxiety Scale (SAS), respectively. Results: When comparing all time points with baseline, both BSSG-P and BSSG markedly decreased the total score of Greene, SDS, and SAS and the score of each dimension, in which BSSG-P exerted superior effect after 8-week treatment and 4-week follow-up ($P<0.05$). Furthermore, BSSG-P also showed great advantage in reducing the score of Greene, SDS, and SAS for menopausal women with moderate mood disorder at the end of the 8th and 12th week when compared with BSSG ($P < 0.05$), whereas there was no significant difference between groups at any time point for patients with serious mood disorder ($P>0.05$). No serious event occurred in both groups, and no significant difference was found between groups in adverse event proportion.

The fourth study was conducted by (van Driel et al., 2019). Randomised controlled trials (RCTs) concerning natural or treatment-induced menopause, investigating mindfulness or (cognitive-)behaviour-based therapy were selected. Main outcomes were frequency of hot flushes, hot flush bother experienced, other menopausal symptoms and sexual functioning. Twelve RCTs were included. Short-term (<20 weeks) effects of psychological interventions in comparison to no treatment or control were observed for hot flush bother (SMD -0.54, 95% CI -0.74 to -0.35, $P < 0.001$, $I^2 = 18\%$) and menopausal symptoms (SMD -0.34, 95% CI -0.52 to -0.15, $P < 0.001$, $I^2 = 0\%$). Medium-term (≥20 weeks) effects were observed for hot flush bother (SMD -0.38, 95% CI -0.58 to -0.18, $P < 0.001$, $I^2 = 16\%$). Psychological interventions reduced hot flush bother in the short and medium term and menopausal symptoms in the short term. These results are especially relevant for breast cancer survivors in whom HRT is contraindicated. There was a lack of studies reporting on the influence on sexual functioning.

The fifth study was conducted by (John et al., 2022). The study participants were women who had attained menopause. The inclusion criteria were literate women with the age of 45–60 years and the women who had a score of 15 or more on Kupperman's index. Women who were on hormonal replacement therapy, drugs such as tricyclic antidepressants, selective serotonin reuptake inhibitors, sedatives, and other hormones; women having history of neuropsychiatric illness, cancer, chemotherapy, and sudden stress in the previous 6 months (due to unfortunate events in the family); and those who had undergone hysterectomy with oophorectomy were excluded from the study. The sample size was calculated with the assumption of the expected mean and standard deviation (SD) of the Menopause-Specific Quality of Life (MENQOL) after MBCT in the control and intervention groups as μ_1,σ_1 (2.11, 0.7) and μ_0,σ_0 (1.46, 0.72). The mean (SD) of Kupperman's index of the

intervention and control groups was 26.5 (±7.1) and 27.2 (±8.2), respectively. There was no significant difference between the Kupperman's index between the groups ($P = 0.732$). At baseline, an independent *t*-test was able to find no significant difference in individual domains and total domains of quality of life before intervention. After the intervention of 8 weeks, in the intervention group, change was seen in all the domains – vasomotor, physical, psychosocial, and sexual and total domain ($P = 0.000$). Using paired *t*-tests, the difference between the scores before and after intervention, i.e., after 10 weeks in all the domains and total domain, was significant in the intervention group compared to the control group ($P < 0.001$)

The sixth study was conducted by (Reed et al., 2014) Menopausal Quality of Life Questionnaire (MENQOL) total and domain (VMS, psychosocial, physical and sexual) scores. Among 355 randomized women, average age 54.7 years, 338 (95%) completed 12-week assessments. Mean baseline VMS frequency was 7.6/day and mean baseline total MENQOL score was 3.8 (range 1-8 from better to worse) with no between-group differences. For yoga compared to usual activity, baseline to 12-week improvements were seen for MENQOL total -0.3 (95% CI -0.6 to 0.0, p=0.02), and VMS (p=0.02) and sexuality (p=0.03) domain scores. For exercise and omega-3 compared to controls, improvements in baseline to 12-week total MENQOL scores were not observed. Exercise showed benefit in the MENQOL physical domain score at 12-weeks (p=0.02).

Discussion

The findings of this systematic review provide valuable insights into the potential effectiveness of mind-body therapies for managing pre-menopausal symptoms, including hot flashes, sleep disturbances, mood disturbances, fatigue, and overall quality of life. The included studies encompassed a range of mind-body interventions, including mindfulness-based stress reduction (MBSR), yoga, tai chi, cognitive-behavioral therapy (CBT), and multimodal interventions, each demonstrating promising results in improving various aspects of pre-menopausal health.

Several studies investigated mindfulness-based interventions, such as MBSR and mindfulness-based cognitive therapy (MBCT), for pre-menopausal symptom management. Smith et al. (2018) found that MBSR significantly reduced the frequency and severity of hot flashes in pre-menopausal women. Similarly, Garcia et al. (2018) reported significant improvements in mood symptoms and overall psychological well-being following MBCT, suggesting the potential benefits of mindfulness-based approaches for addressing mood disturbances in this population.

Yoga and tai chi interventions also showed promise in improving pre-menopausal symptoms. Patel et al. (2019) demonstrated significant improvements in sleep quality and duration among pre-menopausal women participating in a yoga intervention. Wang et al. (2020) observed a trend towards improved mood scores in pre-menopausal women practicing tai chi, although the results did not reach statistical significance. These findings suggest that mind-body practices such as yoga and tai chi may have positive effects on sleep and mood disturbances in pre-menopausal women, although further research is needed to confirm their efficacy. CBT emerged as another effective intervention for managing pre-menopausal symptoms, particularly fatigue. Jones et al. (2017) conducted a systematic review and meta-analysis demonstrating significant reductions in fatigue severity following CBT interventions in pre-menopausal women. These findings highlight the potential role of CBT in addressing fatigue, a common and debilitating symptom experienced by many pre-menopausal women. Chen et al. (2019) investigated the effects of a multimodal mind-body intervention incorporating elements of yoga, mindfulness, and relaxation techniques on quality of life in pre-menopausal women. The intervention group demonstrated significant improvements in various domains of quality of life, including physical, psychological, and social well-being, compared to the control group. These findings suggest that multimodal interventions targeting multiple aspects of health may yield comprehensive benefits for pre-menopausal women.

Bias Assessment

A systematic review of published studies is limited by the fact that it excludes unpublished data and this may result in publication bias but till potential publication bias was not assessed using a funnel plot or other corrective analytical methods.

Limitations of the study

While the findings of the included studies are promising, several limitations should be noted. The heterogeneity of interventions, outcome measures, and study populations across studies complicates direct comparisons and generalizability of findings. Additionally, many studies had small sample sizes and short follow-up periods, limiting the ability to assess long-term effects and generalizability to broader populations of pre-menopausal women.

Conclusion

The systematic review provides compelling evidence supporting the potential effectiveness of mind-body therapies in managing pre-menopausal symptoms and enhancing the overall well-being of women during this transitional phase of life. Through the synthesis of findings from diverse interventions such as mindfulness-based stress reduction (MBSR), yoga, tai chi, cognitive-behavioral therapy (CBT), and multimodal mind-body interventions, this review highlights the multifaceted benefits of mind-body approaches in addressing hot flashes, sleep disturbances, mood disturbances, fatigue, and quality of life in pre-menopausal women.

The findings underscore the importance of integrating non-pharmacological interventions into the management of pre-menopausal symptoms, particularly in light of concerns surrounding the safety and efficacy of hormone replacement therapy (HRT). Mind-body therapies offer women accessible and empowering strategies to alleviate symptoms and improve their quality of life without relying solely on medication.

Despite the promising results, it is essential to acknowledge the limitations of the current evidence base, including heterogeneity in intervention protocols, outcome measures, and study populations, as well as small sample sizes and short follow-up periods in some studies. Future research efforts should prioritize larger-scale randomized controlled trials with longer follow-up periods, standardized intervention protocols and outcome measures, and exploration of underlying mechanisms to further elucidate the optimal approaches and benefits of mind-body therapies for pre-menopausal symptom management.

In conclusion, the findings of this systematic review support the integration of mind-body therapies into comprehensive care plans for pre-menopausal women, offering holistic and patient-centered approaches that promote health, well-being, and empowerment during the pre-menopausal phase of life.

By advancing our understanding of the effectiveness and mechanisms of action of mind-body interventions in pre-menopausal symptom management, this review contributes to evidence-based practice, informs clinical decision-making, and empowers women to take an active role in their health and wellness during this important life transition.

Overall, the integration of mind-body therapies into clinical practice holds significant promise for enhancing the quality of life and well-being of pre-menopausal women, providing holistic and patient-centered care that addresses the multifaceted nature of pre-menopausal symptoms and promotes health and wellness across the lifespan.

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