Review Article:

Systematic Review of Non-Pharmacological Therapies for Reducing Anxiety in the Postpartum Period

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Abstract

Maternal anxiety can adversely impact the emotional, psychological, and social development of infants, making it essential to explore strategies for reducing anxiety. This study evaluates the effectiveness of non-pharmacological therapies in alleviating postpartum anxiety. A literature search across PubMed, ScienceDirect, Cochrane Library, and Medline identified 3,503 articles, of which 12 met the inclusion criteria. Study quality and bias were assessed using CASP and RoB 2 tools. The therapies examined included Cognitive Behavioral Therapy (CBT), aromatherapy, massage, and music therapy. CBT was the most frequently studied and effective intervention, appearing in four studies with strong significance in reducing anxiety levels. Four studies focused on non-pharmacological therapies directly administered to postpartum women, demonstrating promising outcomes. However, further analysis is required to assess the impact of social support in alleviating postpartum anxiety. In conclusion, therapies like CBT, aromatherapy, massage, and music have shown effectiveness in reducing postpartum anxiety. Future research should emphasize integrating social support systems to enhance these interventions.

Key words:

Anxiety, obstetric, postpartum, non-pharmacological, therapy

Introduction:

The process of childbirth and the transition to motherhood stand as pivotal and transformative occurrences in a woman's life[1]. However, it may also be perceived as a demanding event [2] due to the labor and delivery experience, which can entail intense pain, fear of mortality, and unforeseen medical interventions as mothers navigate through these stages[3]. Additionally, they encounter expectations, uncharted needs, novel hurdles, and significant adjustments [4]. Embracing motherhood and assuming responsibility for a new life entail assuming an entirely new role, accompanied by lifestyle modifications and associated anxieties, particularly during the initial pregnancy and childbirth experiences [5].

Consequently, finding oneself in such circumstances may heighten susceptibility to the emergence or reappearance of mental and emotional issues [6]. Anxiety emerges as a prevalent emotional response among women facing these pressures [7]. These distressing and nebulous sensations arise in reaction to either inside or outside triggers, leading to physical, mental, intellectual, or personality manifestations [8].

During the postnatal phase, anxiety is widespread, with prevalence rates ranging from 9 to 20% within the initial year following childbirth [8]. Considering its significant prevalence, maternal anxiety following delivery remains relatively unexplored. The condition is linked with adverse outcomes for both mothers and infants, exerting detrimental effects on maternal self-assurance, sleep patterns, breastfeeding, parent-child bonding, and the behavioral development of infants and adolescents [9–11]. Suicide ranks as the second leading cause of maternal mortality, and perinatal anxiety elevates the risk of suicidal thoughts among women in US [12]. The economic burden of postpartum anxiety extends to mothers, healthcare systems, and society at large [13,14].

Anxiety may be discovered inadvertently when inspection of depression after delivery, and it can occur either alongside or separately. Symptoms of postpartum anxiety often go unnoticed, potentially resulting in a missed diagnosis if a patient screens negatively for postpartum depression but exhibits isolated anxiety [15]. The World Health Organization has highlighted the urgent need for evidence-based, cost-effective services to detect maternal mental health disorders early, advocating for screening and interventions for postpartum anxiety [16]. Additionally, the United States Preventive Services Task Force (USPSTF) has recently advised "screening for anxiety in adults, including those who are pregnant and postpartum [17].

Anxiety after delivery can manifest in various forms, including generalized anxi-

ety, obsessive-compulsive symptoms, panic attacks, and health anxiety. New mothers may experience excessive worry about their baby's health, fear of making mistakes, or intrusive thoughts that interfere with their ability to care for themselves and their infant. The presence of postpartum anxiety can significantly disrupt a mother's daily life, affecting sleep, bonding with the baby, and functioning in daily tasks. Anxiety symptoms often contribute to difficulties in decision-making, reduced self-care, and challenges in the mother-infant relationship, which can, in turn, influence infant development and family dynamics [18,19]. Given these effects, addressing postpartum anxiety is essential not only for the well-being of the mother but also for the infant and the broader family. Early identification and support for mothers experiencing postpartum anxiety can improve health outcomes and facilitate a more positive postpartum experience [19].

A previous review investigated the patient-reported outcome measures used in postpartum recovery, identifying tools utilized to evaluate the anxiety. However, this review did not assess methodological rigor, bias risk, overall psychometric performance, or evidence levels regarding these instruments [20]. Prior review study of non-pharmacological strategies also have targeted the mitigation or avoidance of stress, anxiety, and/or depression throughout pregnancy, childbirth, or the postnatal period. For example, Bastos et al. [21] conducted a systematic review assessing the impact of debriefing interventions versus conventional postnatal care for averting psychological trauma in postpartum women. Other researchers have focused on evaluating various alternative interventions, including family psychosocial and psychological approaches, hypnosis, enhanced feedback during antenatal ultrasound appointments, and mind-body techniques, aiming to prevent mental health problems in mothers transitioning to parenthood [22,23]. This review aimed to assess the effectiveness of different non-pharmacological therapies in reducing anxiety levels among women during the postpartum period.

Methods:

Protocol:

The research question was formulated using the PICO methodology. The literature review adhered to the PRISMA Declaration recommendations (Moher et al., 2009). This review conforms to the 2020 guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [24].

Search Strategy:

Our investigation encompassed a thorough exploration of diverse databases including PubMed, ScienceDirect, Cochrane

Library, and Medline. To optimize search outcomes, we tailored our query terms for each database, employing phrases such as "postpartum," "anxiety," "women," "mental disorders," to align with their respective vocabularies. Integration of these keywords was achieved through the use of Boolean operators such as "AND" and "OR." We limited our search to articles published in English and applied additional filters to enhance the specificity and relevance of the results.

Eligibility Criteria:

In this review, randomized controlled trials (RCTs) investigating anxiety levels in postpartum women were included. The search timeframe was not limited to facilitate a comprehensive gathering of pertinent research. However, studies published in conference proceedings, reviews, meta-analyses, commentaries, book chapters, reports, case studies, and letters to the editor were excluded from the analysis.

Tabel 1: PICO statement:

Item	Statement
Population	Primiparous, nulliparous, and multiparous women aged 18 years or older in the postpartum period (up to 2 years after childbirth).
Intervention	The therapist-assisted internet-based cognitive behavioral therapy (iCBT) was administered via online platforms, email correspondence, telephone calls, or Skype sessions. This iCBT approach necessitated therapist support through various means like phone conversations, email exchanges, text messaging, and interactive computer interfaces. The intervention encompassed at least one component of cognitive behavioral therapy (CBT), such as cognitive restructuring, behavioral activation, or skills training. Other non-pharmacological therapy including aromatherapy, music, massage
Comparison	Attention direction, waitlist, or treatment as usual (TAU)
Outcomes	anxiety signs at following the treatment
Type of studies	RCTs

Selection Process:

Two authors conducted individual and autonomous screenings of the titles or abstracts of the identified studies. If discrepancies arose between the screening authors, the final decision was made by the primary author. This initial screening process entailed evaluating the titles, objectives, and conclusions of the relevant studies. Additional examination of specific studies involved a thorough review of the main text to collect supplementary information when necessary.

Study Quality:

Reviewers independently evaluated literatures to assess quality for inclusion. While not obligatory in systematic review protocols, reviewers believed this step would aid in identifying the strengths and weaknesses of the selected studies. Given the diverse ar-

ray of articles, the Critical Appraisal Skills Program (CASP) for randomized studies was selected for its capacity to assess study quality. CASP provides a clear, structured set of questions tailored to different study designs, ultimately for Randomized studies. Each checklist from CASP includes 11 questions tailored to the study type, with "yes," "no," or "can't tell" options for responses, which allows for a structured and consistent appraisal. Study quality is categorized into three levels: Strong, Moderate, and Weak. Strong quality is determined if all answers are affirmative, Medium if there are two answers other than affirmative (Can't tell or No), and Weak if there are three answers other than affirmative.

Risk of bias:

The evaluation of bias in each study was conducted using the Risk of Bias in Randomized Studies (ROB2-tools) [23]. The RoB 2 tool was selected because it provides a structured and validated approach for evaluating potential sources of bias specific to RCTs, covering key domains such as randomization, deviations from intended interventions, missing outcome data, measurement of the outcome, and selective reporting. This tool ensures a thorough and consistent quality assessment across included studies, thereby enhancing the reliability of our review findings. ROB2 comprises five domains designed to evaluate both internal and external validity. Assessment outcomes for these domains are categorized as Low, Some concerns, High, and Very High. The results of the ROB assessment were reviewed and endorsed by all authors, considering input from external reviewers.

Data Extraction and synthesis:

In order to enhance understanding of the content within the eligible studies, key information has been condensed into a table format. Two authors worked together during this process of gathering data. Any discrepancies in extracted data were resolved through mutual agreement. The criteria for extraction encompassed details such as the primary author, year of publication, country, study design, participants, intervention, assessment method, protocol and duration, and principal outcomes.

Results:

The initial database query yielded 3,503 articles. Following the removal of 2,490 duplicates and irrelevant articles unrelated to the review's focus, 1,013 articles were available for screening. In the eligibility evaluation, 92 studies underwent assessment, resulting in the exclusion of 80 articles for diverse reasons. Ultimately, only 12 studies fulfilled the criteria and will advance to the subsequent stage for data extraction and analysis.

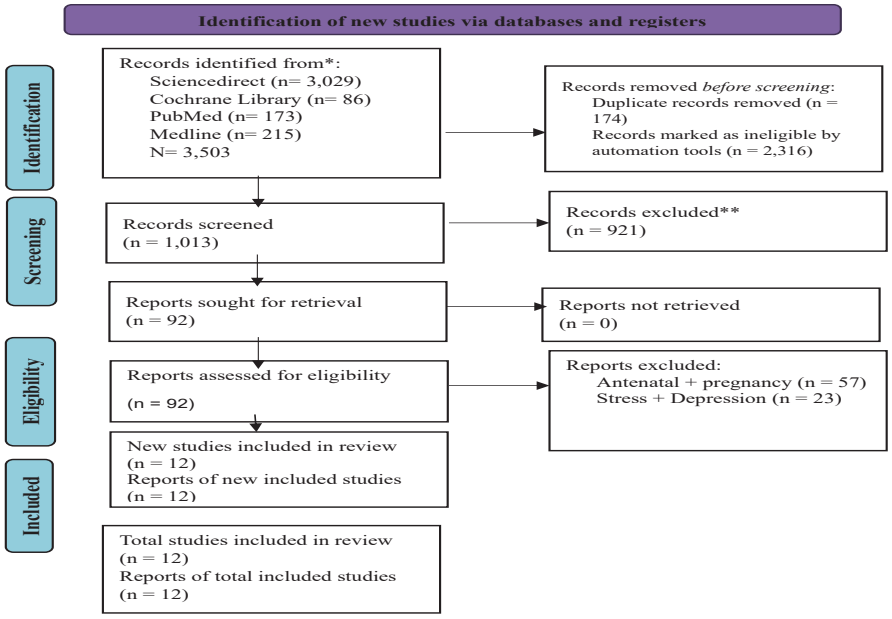


Figure 1. PRISMA flowchart for study selection

Table 2. Characteristics of Studies Included:

Author, Year, Country	Design	Participants	Therapies	Procedures and Duration	Evaluation Tools	Main findings
Abhari et al., 2021, Iran [25]	RCT	60 primiparous	Counseling (Gamble's Approach)	Participants received three sessions prior to delivery: two face-to-face sessions lasting 60-45 minutes at 35 and 37 gestational weeks, and one 10-15 minutes telephone session at 36 gestational weeks; One face-to-face postpartum counseling session lasting 60-45 minutes, performed within 4-12 hours after delivery.	DASS-21	There was a notable difference (P=0.008), with the mean anxiety score in the intervention group significantly lower than that in the control group.
Charandabi et al., 2017, Iran [26]	RCT	126 spouses; Gestational Ages of 24–28 weeks.	life-style-based training	Participants attended two training sessions per week (lasting 60–90 minutes) between 24 and 28 weeks of pregnancy; received a training booklet, 10-minute telephone counseling sessions once a week between and after the training sessions.	EPDS, SSTAI	The average score of trait anxiety significantly decreased in the intervention group compared to the control group (p=0.001).

Conrad et al., 2012, US [27]	RCT	28 women, 0 - 18 months postpartum	the aromatherapy hand m'technique	15 min sessions; twice a week (four weeks)	EPDS GAD-7	Significant differences between CG dan IG at both the midpoint and final scores (EPDS midpoint p= 0.006, final p = 0.039 and GAD midpoint p = 0.027, final p = 0.020).
Jahdi et al., 2016, Iran [28]	RCT	100 primiparous mothers	slow-stroke back massage	20 min, 12 weeks	Spielberger's state anxiety inventory (STAI)	Significant differg ence between state anxiety before and after the massage and the next morning (P < 0.001)
Kianpour et al., 2016, Iran [29]	RCT	140 women	Aromatherapy: three drops of lavender essential oil	every 8 h with for 4 weeks	DASS-21 Edinburg 10-item	The mean levels of stress, anxiety, and depression were significantly lower in the IG compared to CG at the 2-week time point (P = 0.012, P < 0.0001, and P = 0.003, respectively), at 1 month (P < 0.0001) and 3 months after delivery (P < 0.0001).
Liu & Yang, 2021, China [30]	RCT	260 primiparous women	cognitive behavior intervention	6-week, once a week (1 h)	EPDS HAMA	Lower in IG than CG (p = 0.032)
Loughnan et al., 2019, Australia [31]	RCT	120 adult women	Internet-delivered cognitive behavioural therapy (MUMentum postnatal)	One lesson every 1 - 2 weeks, up to 6 weeks	GAD-7	There were significant improvement on anxiety according to the GAD-7 (p < 0.001)
Milgrom et al., 2011, Australia [32]	RCT	143 women	Towards parenthood intervention	Nine units of a self-help workbook —8 units to be read during pregnancy and 1 unit after the birth for 6 weeks	DASS 21 EPDS	Significant treatment effects in intervention group were also observed on the anxiety subscale of the DASS (F=7.35, p<.01).

Mirghafourvand et al., 2017, Iran [33]	RCT	96 postpartum women	Orange Peel Essential Oil	Participants were instructed to take 10 drops three times daily (after each meal) in a glass of water for 8 weeks; follow-up phone calls 2 and 5 weeks after the study began.	STAI	no significant difference between the groups before and after the intervention (P = 0.469 and P = 0.726, respectively)
Norouzi et al., 2013, Iran [34]	RCT	90 Iranian women post c-section	Music during Kangaroo care	30 min; supine position; using headphones	STAI	a significant decrease in the level of MSA in the IG, but exposure to music during KC had no effect than KC only
Shulman et al., 2018, Canada [35]	RCT	- 30 women at a maternity hospital - Age: 27 to 42 years	Mindfulness-Based Cognitive Therapy	once a week for 8 weeks	GAD	anxiety levels decreased, mindfulness levels increased (p < 0.01)
Tseng et al., 2010, Taiwan [36]	RCT	77 postnatal women	music at home	30 minutes a day for two weeks and regular postpartum care	STAI	No significant decreased on STAI scores (p =0.258)

***RCT:** Randomized Controlled Trial; **IG:** Intervention Group; **CG:** Control Group; **DASS:** Depression Anxiety Stress Scales; **EPDS:** The Edinburgh Postnatal Depression Scale; **STAI:** The State-Trait Anxiety Inventory; **SSTAI:** Short-form of STAI; **GAD:** Generalized Anxiety Disorder; **HAMA:** Hamilton Anxiety Rating Scale

Characteristics of eligible studies:

Most of the studies included in this review were conducted in Iran (n=6) [25,26,28,29,33,34], and two studies were from Australia[31,37,]while one study each was conducted in the US [27], China [30], Canada [35], and Taiwan [36]. This review focuses on studies that are included in experimental studies (RCTs) in order to obtain information on the effectiveness of therapies provided to postpartum women who experience anxiety or have the potential to experience it. The range of participants involved in the studies reviewed was 28 to 260 women.

Based on the main findings, there are two studies [33,36] that show insignificant results on reducing anxiety in postpartum women, where the anxiety measurement score is not much different between the baseline score and the score after the intervention. Meanwhile, ten other studies showed highly significant results. The anxiety assessment instruments used are quite varied, including the 21-item Depression Anxiety Stress Scales (DASS)[25,29,32], the State-Trait Anxiety Inventory (STAI) [26,28,33,34,36], the 7-item Generalized Anxiety Disorder (GAD) [27,31,35], and the Hamilton Anxiety Rating

Scale (HAM-A) [30].

Quality of the studies included:

The study quality assessment used CASP for Randomized Control Trial studies and is summarized in Table 3. Most of the studies were in the Strong quality category (n=10) [26–31,33,34,36,37]. Meanwhile, two studies were in the Medium quality category (n=2) [25,35].

Tabel 3. Summary of Quality assessment of studies included:

Studies	Questions											Overall
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	
Abhari et al [25]	Y	Y	N	Y	Y	CT	Y	Y	Y	Y	Y	Medium
Charandabi et al [26]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Conrad et al [27]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Jahdi et al [28]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Kianpour et al [29]	Y	Y	Y	Y	CT	Y	Y	Y	Y	Y	Y	Strong
Liu & Yang [30]	Y	Y	Y	Y	Y	CT	Y	Y	Y	Y	Y	Strong
Loughnan et al. [31]	Y	Y	CT	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Milgrom et al. [32]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Mirghafourvand et al. [33]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Norouzi et al. [34]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Strong
Shulman et al. [35]	Y	Y	N	Y	CT	Y	Y	Y	Y	Y	Y	Medium
Tseng et al. [36]	Y	Y	Y	Y	Y	CT	Y	Y	Y	Y	Y	Strong

Risk of Bias in Included RCTs

Most studies were in the "Some concerns" bias category (n=8) [25,27,29–31,35–37]. Referring to the risk of bias assessment, most studies did not provide accurate information regarding the randomization process. Meanwhile, four studies showed deviation from the intended intervention[25,31,34,35]. One study only showed two domains that were in the Low-risk category, so the overall decision was High Risk of Bias [35]. Three studies were strongly in the Low-risk category in all domains of the Risk of Bias assessment [26,28,33].

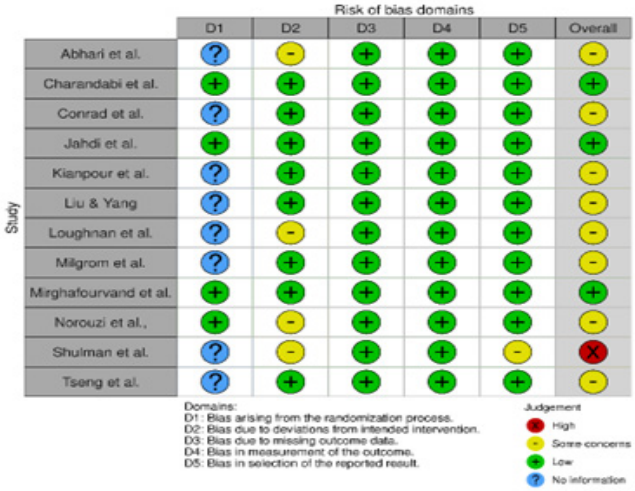


Fig. 2 :Traffic-light plot of Summary of Risk of Bias:

Types of therapy to reduce anxiety level in postpartum period:

In general, the therapies used in the eligible studies in this review can be grouped into web-based [31], cognitive and behavioral [25,30,31,35], book-based (electronic and workbook)[26,32], aromatherapy-based (Lavender, Rosa damascene, Orange) [27,29,33], massage [28], and music [34,36].

Most of the therapies used in the studies included in this review were cognitive and behavioral based. The Chinese study conducted a Cognitive Behavior intervention consisting of five different parts including psychological evaluation, self-activity plan, mental health care, enhanced the care for patients after delivery, and communication to family members[30]. A Canadian study adopted a comparable approach, concentrating on an eight-week Mindfulness-Based Cognitive Therapy program. This program included teachings on monitoring thoughts and emotional states, enhancing sensory awareness of the body, and cultivating mindfulness of mental processes [35]. Meanwhile, an Australian study conducted internet-based cognitive-behavioral therapy, where participants received virtual services after being given an account and then logging into a web virtual clinic [31].

Counseling based on Gamble's approach contains initiating the initial dialogue involves posing uncomplicated and non-intimidating open-ended inquiries concerning pregnancy and maternal viewpoints on childbirth. This prompts mothers to freely articulate their emotions and ideas, while also addressing any misconceptions or uncertainties related to the topic at hand. Engaging mothers in discussions regarding the correlation between their present emotions and actions with past anticipations and convictions, fostering optimistic maternal perspectives, and empowering them to make informed decisions regarding practical resolutions. Offering strategies to address negative sentiments, cultivating a constructive outlook on childbirth, furnishing essential childbirth management information, dispelling any uncertainties or misconceptions mothers may have, and recognizing their capabilities to tackle challenges independently. Reviewing labor and delivery procedures, highlighting the importance of emotional support, and collaboratively determining practical solutions.

One study in Iran utilized life-style based therapy, which included sleep health, nutrition, physical and sports activity, self-image and sexual problems. Participants were given a training booklet to study and interspersed with telephone-based counseling 26. With a similar approach, one study in Australia used a workbook for participants to learn during pregnancy and after

pregnancy interspersed with counseling through telephone calls every week [32].

There are three studies that utilize essential oils for participants during the postpartum period. The essential oils used include 2% rose-lavender blend which is applied by inhalation for 15 minutes [27], Lavender only which is applied on the palms of the participants three times a day at 8-hour intervals[29], Orange peel which is given to participants to drink 10 drops in a glass of water after each meal[33]. We also found two studies that utilized music as a therapy in reducing anxiety experienced by postpartum women. A study in Iran applied Kangaroo care combined with music. Mild instrumental music, including relaxation songs by Johann Sebastian Bach, was chosen together with a neurology expert to be played over headphones during KC induction. The audio player was triggered immediately after KC induction and sounded for 30 minutes [34]. Meanwhile, in Taiwan, researchers applied music therapy by listening to the music while participants were at rest, at bedtime or while performing chores for 30 minutes. The selection of music comprised lullabies such as Brahms' Lullaby, Twinkle-Twinkle Little Star, and Cradle Song, classical pieces including Beethoven's Fur Elise, Debussy's Preludes I Livre VIII, and Kreisler's La Fille aux Cheveux de Lin and Liebesfreud, as well as nature sounds like Another Day, Friendly Natives, and Tropical Mystery. Additionally, crystal music from Chinese nursery rhymes and songs such as Little HoneyBee, Doll Country, and Jasmine was included. The researcher ensured that all chosen songs had a tempo ranging between 60 and 80 beats per minute[36].

Through physical touch, in the period 2010 to 2024, we found only one study that used physical touch in the form of slow-stroke back massage. This therapy was performed with steps including applying small circular below the base of the skull to the upper neck. Stroke down smoothly at the base of the skull of the spine to the participant's waist. Stroking downward from the neck beneath the ears to the shoulder blades. Starting from the shoulders and gliding down to the waist. The procedure ended with the therapist placing her hands on each side of the participant's neck and performing long, continuous strokes down the neck, across each shoulder, and along the back near the spine, repeating the entire process several times [28].

Effect of the Therapies on the Anxiety level of Postpartum period:

Most of the studies showed significant effectiveness referring to the statistical p value (n=10)[25–32,34,35]. Meanwhile, two studies showed non-significant effects at p value[33,36]. Overall, before the intervention started the baseline score showed no signif-

icant difference, and after the intervention the difference between the two groups was significantly different.

Discussion:

This review collects and evaluates the various therapies used to prevent and even reduce the anxiety levels of women in the postpartum situation. The information provided in this review can be a fully useful reference for clinicians, students, and researchers in exploring the potential of reducing postpartum patient anxiety non-pharmacologically. Although most of the included studies measured something other than anxiety, we only extracted the required anxiety-related information from the participants. In some studies, depression and stress were simultaneously assessed using standardized instruments that are widely used.

The studies examined exhibit considerable diversity in patient profiles, treatment modalities, and outcome assessment methods, which restricts the ability to derive definitive clinical conclusions. Consequently, it may be prudent to acknowledge the potential utility of addressing anxiety in bipolar disorder through psychological interventions, albeit the optimal approach remains unclear. From the limited pool of randomized controlled trials (RCTs), cognitive behavioral therapy (CBT) supplemented with targeted components for anxiety management emerges as the most supported approach.

Cognitive-behavioral therapy was consistently used and analyzed in most studies. Cognitive behavioral intervention is frequently combined with supplementary mental health care in clinical therapy for patients experiencing depression and anxiety [38]. Cognitive behavioral intervention, as a complex therapeutic approach, consists of rational-emotive therapy, exposure therapy, systematic desensitization, relaxation techniques, social skills training, and supportive therapy [39,40]. Within cognitive behavioral intervention, the therapist assesses the patient's motivation and treatment progress by observing clinical performance, considering subjective needs, and reflecting on patient introspection. Tailored treatment plans are then developed for individuals experiencing anxiety [41]. All studies that analyzed the use of CBT showed highly significant statistical values with adequate intervention duration ranging from six to eight weeks, where each session was conducted with sufficient time (45 to 60 minutes) to be able to extract information from participants. However, of the four studies that applied CBT, there were differences in the characteristics of the participants recruited, especially in terms of gravidity and parity status, which were very diverse, although most were primiparous. A study

in Canada states that First-time mothers exhibited reduced self-efficacy compared to those who had previously given birth. Consequently, first-time mothers experienced elevated symptoms of postpartum anxiety in comparison to women with multiple childbirth experiences [42]. Not only in CBT, but also in other therapies, the participants recruited were very diverse in parity and age.

Social support seems to be an important enough variable to be considered as part of therapy to reduce anxiety levels in the postpartum period. One study analyzed involved the role of husbands to support wives during the postpartum period with a p value of 0.001. This shows the importance of the presence of women's closest family to accompany them during this period. Di China, Factors contributing to postpartum anxiety symptoms encompassed experiencing fatigue and depression symptoms, while receiving support from family and feeling content with the labor experience served as protective factors [43]. Another study in the US found the same thing where support from family is very supportive of preventing anxiety, even support from friends has also been found as a significant protective factor. support from friends also showed the largest effect size compared to the other variables [44]. Support from society emerges as a significant target for programmatic adjustment [45]. Another notable finding from a systematic review was the significance of receiving support from fellow mothers, whether in person or through online forums. The study also noted that insufficient support from partners, friends, and family members was linked to an increased risk of symptoms of depression and anxiety. In addition, informational and emotional support from healthcare professionals can be a buffer against depression and anxiety [46].

Aromatherapy using essential oils seems to work better by inhalation than by drinking. It is best used as an adjunct to, but not a substitute for, allopathic treatments. Molecularly, aromatherapy using lavender resulted in a marked decrease in the release of cortisol from the adrenal glands, increased secretion of serotonin from the digestive system, and decreased levels of anxiety during labor [47,48]. Similar to aromatherapy, using music was also not significant in reducing anxiety. Even the combination of 30 minutes and two weeks of regular postpartum care did not significantly reduce STAI scores [36].

Limitation:

This review aimed to comprehensively compare various non-pharmacological interventions developed for use during the postpartum period across different global regions. All the studies reviewed were randomized clinical trials with large partici-

pant pools and showed moderate to strong methodological rigor, underscoring the robustness of their findings. Additionally, where feasible, effect sizes reported in the studies were considered, enabling a summary and comparison not only of intervention effectiveness but also the magnitude of their effects.

The omission of the term "depression" from our search criteria might have excluded certain studies that investigated both depression and anxiety. Given the range of assessment tools for anxiety and the heterogeneity in result reporting, and number of studies included, conducting a meta-analysis was unfeasible. The scarcity of interventions conducted in European nations, as evidenced by study characteristics, could be linked to differing levels of medicalization within these societies. Notably, our research identified Iran as the leading country in terms of publishing articles on non-pharmacological treatments. An implication of the fact that most included studies are from Iran is that the findings of this review may have limited generalizability to other regions, particularly those with differing healthcare practices, cultural perceptions of mental health, and levels of medicalization, such as European nations. This concentration of research from Iran may reflect regional priorities or healthcare approaches toward non-pharmacological treatments, but it suggests that more studies from diverse geographic and cultural contexts would be valuable for a more comprehensive understanding of the effectiveness of these interventions globally.

Conclusion:

There exists proof that non-pharmacological approaches can effectively mitigate anxiety during the transition to parenthood, particularly throughout pregnancy and the postnatal phase. Among the interventions that exhibited significant efficacy in alleviating postpartum anxiety were cognitive behavioral therapy, aromatherapy, back massage, and music in conjunction with standard care. Given the findings of this research, it is advisable to redirect intervention efforts toward different demographics, such as couples or entire families. Nurses and midwives play crucial roles as gatekeepers to non-pharmacological interventions aimed at anxiety reduction, underscoring the necessity of training in this domain for these healthcare professionals.

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