Impact of Pregnancy Yoga on Maternal Mental Well-Being

A Meta-Analysis Research

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This meta-analysis aims to assess the impact of pregnancy yoga on the mental health of women. Conducted without any temporal restrictions, our study collected data from PubMed, Web of Science, EBSCOhost, Google Scholar, and YÖK Thesis Center databases from September to December 2023. Following a thorough review, 9 studies were included in the analysis. Our meta-analysis indicated that the application of yoga during pregnancy significantly contributed to reducing depression (SMD: – 0.496, 95% CI: – 0.752 to –0.241; Z = – 3.807; $P < .05$) anxiety levels among pregnant women (SMD: – 0.739, 95% CI: – 1.22 to –0.256; Z = – 2.99; $P < .05$). The study concludes that yoga is an effective intervention for enhancing the mental health of pregnant women, leading to reduced anxiety and depression levels. Pregnancy yoga is suggested as a supportive practice to maintain the overall well-being – physical, mental, and spiritual – of expectant mothers, contributing to their adaptation to the challenges of parenthood by positively influencing the physiological and psychological transformations experienced during pregnancy. **KEY WORDS:** *mental health, meta-analysis, pregnant women, yoga Holist Nurs Pract* 2026;00(0):1–9

INTRODUCTION

Pregnancy constitutes a transformative process affecting a woman's physical, mental, emotional, and spiritual well-being.[1] Any deterioration in the pregnant woman's physical, mental, or psychosocial dimensions can have adverse effects on both the mother and the baby. Maternal stress and anxiety have been linked to various pregnancy complications, including spontaneous abortion, intrauterine growth retardation (IUGR), preterm labor, and preeclampsia. Current literature suggests associations between maternal stress and factors such as cesarean birth[2] and increased use of analgesics during normal birth.[3] Extensive evidence highlights that anxiety, depression, and stress during pregnancy pose risks of adverse maternal and fetal outcomes, ranging from preterm labor and low birth weight to negative neurodevelopmental outcomes in infants and children. Moreover, common discomforts such as low back pain, leg cramps, edema, breathing difficulties, and sleep disorders arising from the pressure due to the growing abdomen in later pregnancy stages can significantly impact the pregnant woman's quality of life. Yoga emerges as a holistic approach capable of balancing these diverse dimensions and fostering positive outcomes for a normal, uncomplicated pregnancy, childbirth, and postpartum experience. Notably, it is characterized by its absence of side effects and increasing adaptability to pregnant women.[1,4,5] Yoga improves some of the risk factors in life due to its beneficial effects on stress reduction, cardiovascular function. Stress is directly related to cortisol levels in the body, and regular meditation and yoga practices are reported to reduce stress and lower serum cortisol levels.[3,4]

Positive effects of yoga have been reported for pregnant women, including less stress, anxiety and pain across pregnancy, less pregnancy discomfort, and less painful labor as well as less time in labor. When

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yoga was compared to walking, complications like pregnancy-induced hypertension with associated intrauterine growth retardation were less frequent in the yoga group as well as the incidence of preterm labor and cesarean delivery.[6] Yoga pranayamas (breathing techniques) and asanas (postures) are practices in which women are instructed to automatically prepare for childbirth by strengthening their bodies. The practice of yoga asanas during pregnancy serves to instill calmness in mothers during the birthing and postpartum periods and enhances the mother-baby relationship by fostering balance, back strength, hip flexibility, and breath control.[1,7,8] Engaging in yoga practices throughout pregnancy not only physically and mentally prepares expectant mothers for childbirth and the postpartum period but also empowers them to tap into their inner self-efficacy during labor. By assisting pregnant women in staying centered and fostering communication with their babies, yoga contributes to a positive birthing experience.[6,9]

Yoga, being a comprehensive and holistic approach, integrates mental, spiritual, emotional, and ethical teachings.[10] In a study comparing prenatal hatha yoga with standard care services, depression symptoms were assessed during pregnancy and the postpartum period, revealing a positive impact of yoga on mood.[11] However, systematic reviews have identified significant variations in pregnancy yoga intervention characteristics, the level of supervision in yoga interventions, the sample population, and measured outcomes. This suggests the need for further exploration of these factors in future studies.[12] Two meta-analyses have consistently reported that yoga serves as an effective complementary treatment for managing prenatal depression and improving birth outcomes.[13,14] Furthermore, Corrigan et al, in a systematic review and meta-analysis, found positive effects of yoga during pregnancy on anxiety, depression, perceived stress, mode of birth, and duration of labor.[15] Although there are important meta-analyses and systematic reviews on the effect of yoga on mental health in pregnant women in the literature, the aim of this study is to examine the level of effect of yoga on mental health in pregnant women.

MATERIALS AND METHODS

This meta-analysis study adhered to the PRISMA checklist (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols)[16] to ensure comprehensive reporting and transparency. To minimize bias, the literature search, article selection, and data extraction processes were independently carried out by the researchers. Subsequently, these steps underwent verification by the researchers. The quality assessment of the studies included in the meta-analysis was conducted by three researchers.

Inclusion and exclusion criteria

The screening of studies in this research followed the PICOS criteria:

- Study group (P: Patient): Pregnant women
- Intervention (I: Intervention): Yoga.
- Comparison (C: Comparison): Yoga practices
- Outcomes (O: Outcomes): Anxiety and depression
- Study Design (S: Study design): Meta-analyses, systematic reviews, and relevant primary studies published in Turkish

Letters to the editor and systematic and traditional reviews were excluded from the scope of this study.

Search strategy

The search was conducted between September and December 2023 across multiple databases, including PubMed (including MEDLINE), EBSCOhost Web of Science, Yök Thesis, and Google Scholar, using keywords such as “pregnant and yoga,” “pregnant and anxiety and intervention,” or “pregnant and yoga and depression” by MeSH.

Selection of studies

The initial search yielded 88 007 records. After removing duplicates, 7021 records were assessed based on title and abstract. Subsequently, 140 studies were identified for full-text examination. Following a thorough review according to the inclusion and exclusion criteria, nine studies reporting results on the impact of psychosocial interventions were considered eligible for inclusion in the meta-analysis. A detailed overview of the article selection process is presented in Figure 1.

Data extraction

Researchers employed a data extraction tool developed for this study to gather essential information from the

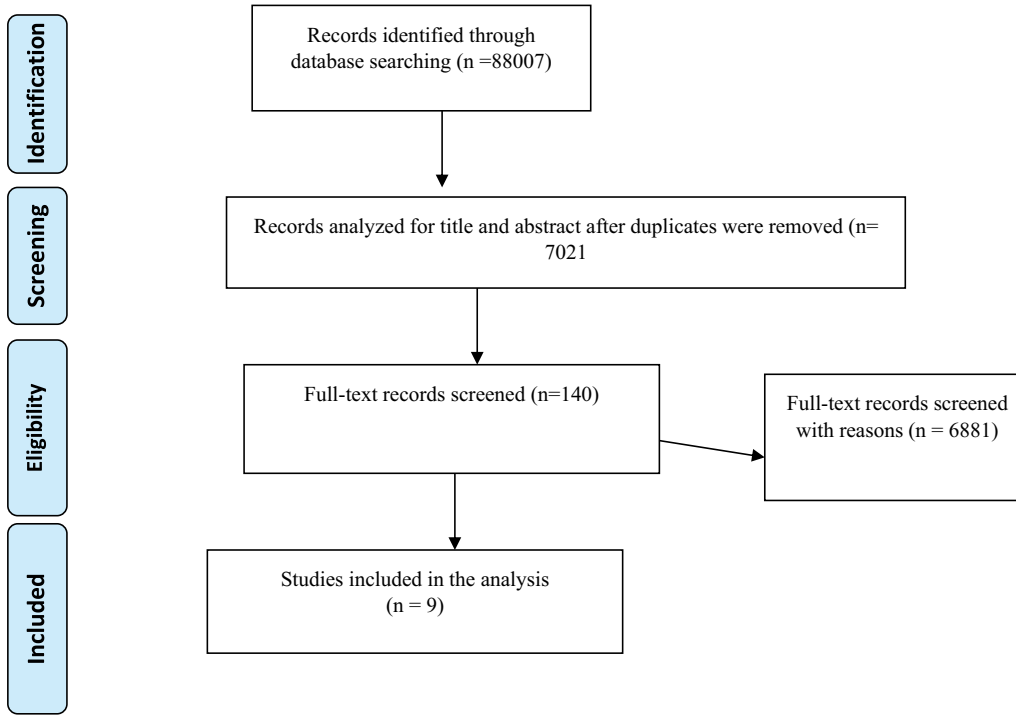

FIGURE 1. Selection of studies according to the PRISMA flow diagram.

selected studies. The tool facilitated the collection of data on key findings, including author and publication year, study design, and other relevant details (Table 1).

Research ethics

This study is a meta-analysis and is based on studies published in the literature.

Assessment of the methodological quality of studies

The assessment of the methodological quality of the studies incorporated in this meta-analysis was carried out by The Joanna Briggs Institute, utilizing quality assessment tools specifically designed according to the research design.[17] These assessment tools included crucial aspects such as sample representativeness of the target population, participant recruitment methods, adequacy of sample size, detailed descriptions of study subjects and settings, the thoroughness of data analysis, the establishment of objective criteria for measuring the outcome variable, defining subpopulations, the reliability of the study, the appropriateness of statistical analysis, and the identification of confounding variables. The quality scores of the included studies were assessed and presented using mean scores, aiding in determining the overall quality as high or low[18] .

The evaluation tools used in this study were selected according to the designs of the studies included in the meta-analysis. In our study, assessment tools consisting of 13-question tools for randomized controlled trials[17] and 9-question tools for quasi-experimental studies[18] were used. The questions in these tools are answered with "Yes, No, Uncertain, Not Applicable" options. The methodological quality level of the studies included in the study was considered "mediocre" if less than 50% of the items were evaluated as "yes," "moderate quality" if 51%-80% of the items were evaluated as "yes," and "good quality" if more than 80% of the items were evaluated as "yes." The data collection tool includes information about the author and year of the study, title, year of the study and year of publication, study area and country, sub-region, study design and type, study population, age participants, sample size, response rate, and outcomes measured. In this study, the evaluation results for each study are shown in Table 1 as *"Quality Score."*

Data synthesis

For the statistical calculations in this study, CMA, version 2, was employed. Heterogeneity between the

TABLE 1. Characteristics and Results of the Included Studies

Author/year	Study design	Country of study	Average age of the sample	Sample size characteristic	Scale	Duration of the intervention	Gestational week	Results	Quality score
Satyapriya et al. (2023)[19]	RCT	India	26.41 ± 3.01	Experimental group:51 Control grubu:45	State trait anxiety inventory HADS: Hospital Anxiety Depression Scale	20 weeks	20-30 weeks	Anxiety and depression levels decreased in pregnant women in the yoga experimental group.	Yes: 8/13 No:3/13 Uncertain:1/13 Not applicable:1/13
Kusako et al. (2016)[20]	Quasi-experimental	Japan	34.4 ± 4.1	60 people	POMS (profiles of mood states original score	17 weeks	34–37 weeks	There was a decrease in the level of anxiety in the pregnant women in the yoga experimental group.	Yes: 9/9
Field et al. (2013)[6]	RCT	USA	24.4 ± (4.7)	Experimental group:40 Control grubu:39	State trait anxiety inventory The Center for Epidemiological Studies Depression Scale (CES-D)	12 weeks	22 weeks	Anxiety and depression levels decreased in pregnant women in the yoga experimental group.	Yes: 13/13
Davis et al. (2015)[21]	RCT	USA	30.15 ± (4.92)	Experimental group:23 Control grubu:23	State trait anxiety inventory The Edinburgh perinatal depression scale (EPDS	8 weeks	28 weeks	There was a decrease in the level of anxiety and depression in the pregnant women in the yoga experimental group.	Yes: 5/9 No:3/9 Uncertain: 1/9
Uebelacker et al. (2015)[22]	RCT	USA	28, 4 ± 5,8	Experimental group:12 Control grubu:8	The Edinburgh perinatal depression scale (EPDS	3 weeks	20 weeks	There was a decrease in the level of anxiety and depression in the pregnant women in the yoga experimental group.	Yes: 13/13

(*continues*)

TABLE 1. Characteristics and Results of the Included Studies (*Continued*)

Author/year	Study design	Country of study	Average age of the sample	Sample size characteristic	Scale	Duration of the intervention	Gestational week	Results	Quality score
Shidhaye et al. (2023)[23]	RCT	India	2.12 ± 3.50	Experimental group:24 Control grubu:24	Perceived Stress Scale (PSS)	10 weeks	12-24 weeks	Pregnant women in the yoga experimental group showed a decrease in depression level.	Yes: 13/13
Field et al. (2012)[24]	RCT	United Kingdom	24.4 ± (4.7)	Experimental group:37 Control grubu:38	State trait anxiety inventory The Center for Epidemiological Studies Depression Scale (CES-D)	12 weeks	22 weeks	There was a decrease in the level of anxiety in the pregnant women in the yoga experimental group.	Yes: 13/13
Beddoe et al. (2009)[25]	Quasi-experimental	USA	30,4 ± 3,6	60 people	State trait anxiety inventory	7 weeks	12-32 weeks	Anxiety and depression levels decreased in pregnant women in the yoga experimental group.	Yes: 9/9
Battle et al. (2015)[26]	Quasi-experimental	Iceland	28.0 ± (5.4)	34 people	The Edinburgh perinatal depression scale (EPDS)	10 weeks	26 weeks	A decrease in the level of depression was determined in the pregnant women in the yoga experimental group.	Yes: 9/9

studies was evaluated using Cochrane Q and Higgins I^2 tests, and an I^2 of more than 50% was considered indicative of significant heterogeneity. The standardized mean difference (SMD) was calculated with a 95% confidence interval (CI) for each outcome variable in the study. A significance level of $P < .05$ was applied to determine statistical significance in all tests.

RESULTS

Six of the studies included in the study were randomized controlled experimental, and three were quasi-experimental with a pre-post-test and a control group. The total sample size of the studies was 498 (intervention group: 175; control group: 169; single group: 154) (Table 1).

In all the studies in this meta-analysis, it was observed that the quality of evidence met more than 50% of the items in the assessment tool (Table 1). This is crucial as it underscores that the information derived from the analysis is grounded in studies of acceptable evidence quality.

Meta-analysis results on the effectiveness of yoga on depression in pregnant women

Given the moderate heterogeneity in these studies, a random effects model was applied ($I^2 = 57.17\%$; $Q = 16.55$, $p>.05$). The large heterogeneity between studies remains largely unexplained by the variables studied. Variations in study sample size and representativeness contribute significantly to the heterogeneity of the prevalence. The meta-analysis outcomes revealed the effectiveness of yoga on depression in pregnant women (SMD: − 0.496, 95% CI: − 0.752 to −0.241; $Z = -3.807$; $P < .05$). Sensitivity analysis conducted using Egger and Begg tests (Egger test: $t = 0.38$, $P = .71$), indicated no publication bias (Begg test: $z = 0.123$, $P = .91$). The funnel plot exhibited no signs of publication bias (Figure 2).

Standardized effect sizes expressed as Cohen's d or Hedges' g were utilized to calculate the effect size.[27] In this study, Cohen's d was employed for effect size calculation, and the statistical significance level was set at 95%. Regarding the effect sizes, Cohen's classification (1988) was considered, where a value between 0.40 and 0.75 indicates a moderate effect. The average effect size, ES = − 0.496, was computed (Figure 3). According to the random effects model, the data from 8 studies reporting results related to depression suggest that yoga applied to pregnant women has a moderate effect on depression.[28] The forest plot depicting the results of the 8 studies within the research scope is presented in Figure 3.

Meta-analysis results on the effectiveness of yoga on anxiety in pregnant women

Given the high level of heterogeneity in these studies, a random effects model was employed ($I^2 = 87.04\%$; $Q = 46.13$, $p>.05$). The large heterogeneity between studies remains largely unexplained by the variables studied. Variations in study sample size and representativeness contribute significantly to the heterogeneity of the prevalence. The meta-analysis findings indicated that yoga was effective in reducing anxiety in pregnant women (SMD: − 0.739, 95% CI: − 1.22 to −0.256; $Z = -2.99$; $P < .05$). Sensitivity analysis, conducted using Egger and Begg tests, showed no evidence of publication bias (Egger test: $t = 1.06$, $P = .33$; Begg test: $z = 0.60$, $P = .54$). Furthermore, the funnel plot displayed no signs of publication bias (Figure 4).

Standardized effect sizes expressed as Cohen's d or Hedges' g were utilized to calculate the effect size.[27] In this study, Cohen's d was employed for effect size calculation, and the statistical significance level was set at 95%. As for the effect sizes, Cohen's classification (1988) was considered, where a value between 0.40 and 0.75 indicates a moderate effect. The average effect size, ES = − 0.739, was calculated in the study (Figure 5). According to the random effects model, the data from 7 studies reporting results related to anxiety suggest that yoga applied to pregnant women has a moderate effect on anxiety.[28] The forest plot illustrating the results of the 7 studies within the research scope is presented in Figure 5.

DISCUSSION

The findings of this study underscore that yoga is effective in promoting the mental health of pregnant women, leading to a notable reduction in anxiety and depression levels. Consistent with our study, Ng et al. argued in their meta-analysis that yoga served as an effective complementary treatment for managing prenatal depression and enhancing birth outcomes.[12] Another meta-analysis reported that yoga practice during pregnancy was effective in reducing depression levels.[11] Furthermore, Corrigan et al. in their

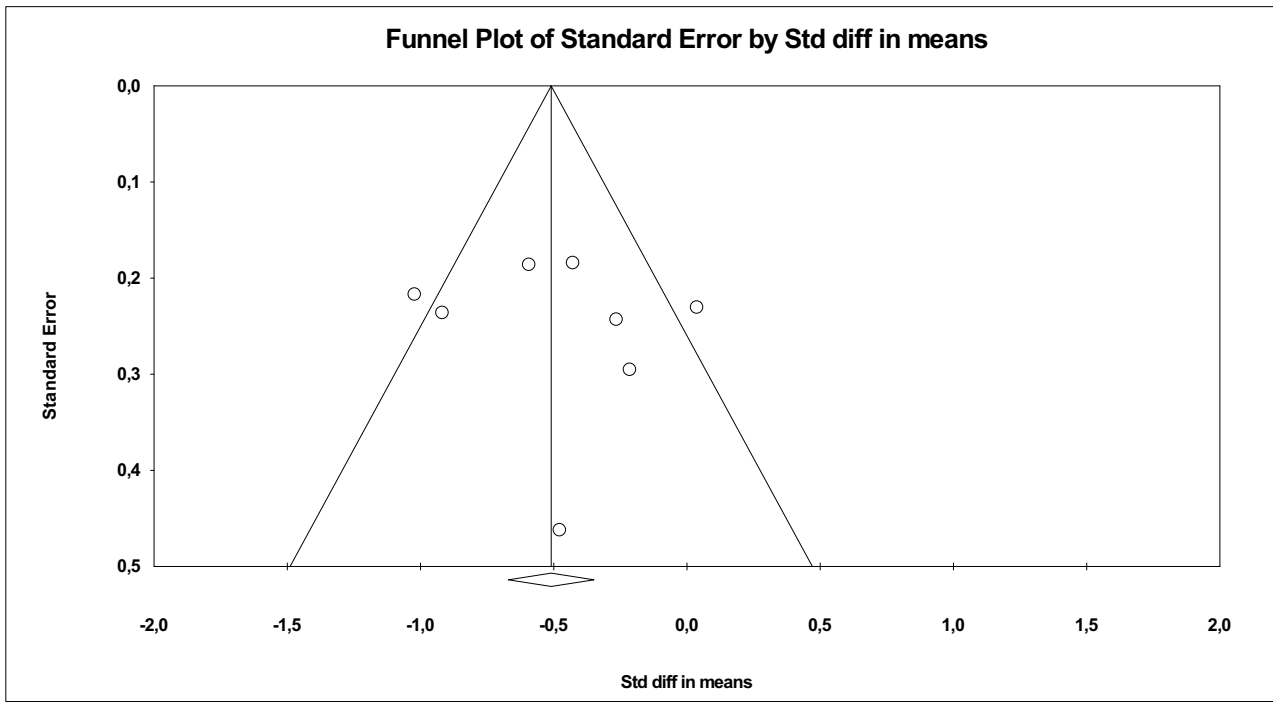

FIGURE 2. Funnel plot of the studies.

systematic review and meta-analysis, reported positive effects of yoga during pregnancy on anxiety, depression, perceived stress, mode of birth, and duration of labor.[14] The results of this study highlight the significance of yoga in addressing depression and anxiety levels among pregnant women.

In a systematic review by Maşa and Ceylan, stress levels and immune functions of pregnant women were compared between those who received prenatal yoga in addition to routine care and those who received only routine care. The study, conducted with pregnant women between the sixteenth and 36th gestational weeks, revealed that prenatal yoga significantly reduced stress levels and improved immune functions in pregnant women. These additional findings further support the positive impact of yoga on the well-being of pregnant women.[13]

In their systematic review, Akarsu and Rathfisch explored the physiological effects of yoga such as salivary cortisol levels, fetal heart rate, maternal heart rate, maternal blood pressure, uterine arterial pressure, low back pain, disability related to low back pain, immune globulin A levels, oxygen saturation, sleep, salivary amylase level, and psychosocial effects like anxiety, depression, anxiety, stress, psychosocial health, and prenatal attachment and reported that

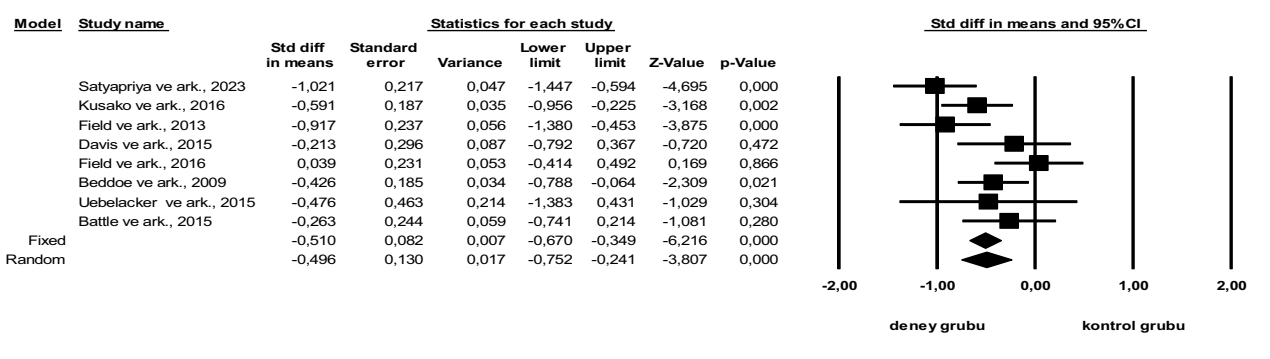

FIGURE 3. Forest plot of the studies.

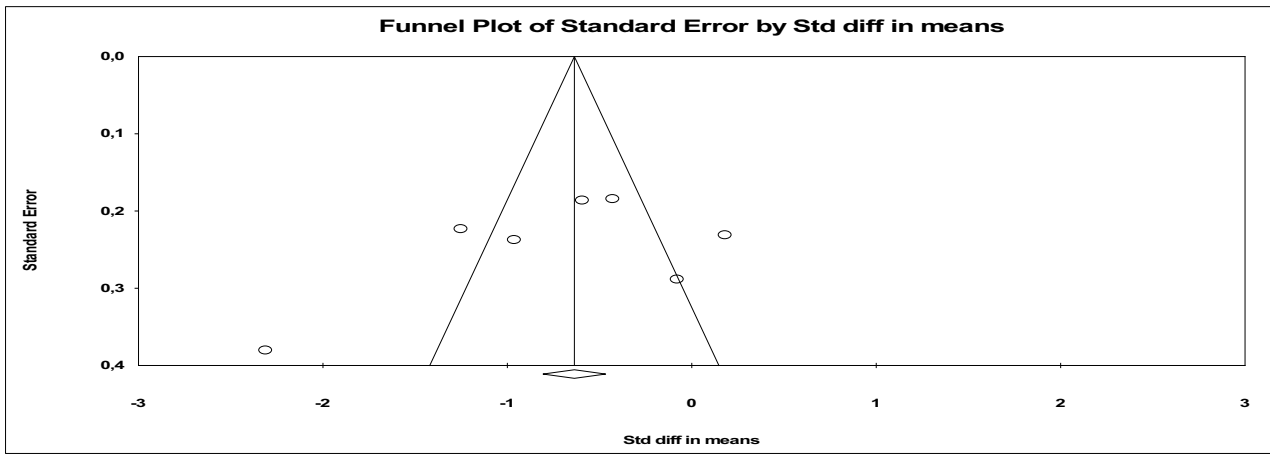

FIGURE 4. Funnel plot of the studies.

pregnancy yoga positively affected all variables examined.[8] After all these considerations, it can be said that pregnancy yoga can be used as an effective method to improve the physiological and psychosocial health levels of pregnant women.

CONCLUSION AND RECOMMENDATIONS

In light of the study's findings, it is concluded that pregnancy yoga serves as an effective method to enhance the physiological and psychosocial health levels of pregnant women. The positive impact of yoga on mental health, along with the observed decrease in anxiety and depression levels, suggests that pregnancy yoga can play a supportive role in preserving the physical, mental, and spiritual integrity of pregnant women and aid in adapting to the parenting process. Recommendations above can be used to support researchers to work collaboratively with yoga practitioners to standardize pregnancy yoga interventions and conduct more robust evidence-based evaluation.

LIMITATIONS

The study acknowledges certain limitations, including small sample sizes in some of the analyzed studies, a lack of blinding, and the utilization of a pre-post-test design. These factors may be considered limitations that could potentially reduce the strength of the evidence in the results.

Implications for practice

It may also be useful to assess stress, pain, and physiological variables in infants at follow-up time points to better understand the effects of a prenatal yoga program on development in specific areas during the early years of life. It is also thought that yoga interventions in the postpartum period may be effective in addressing these areas of concern and in treating or preventing certain

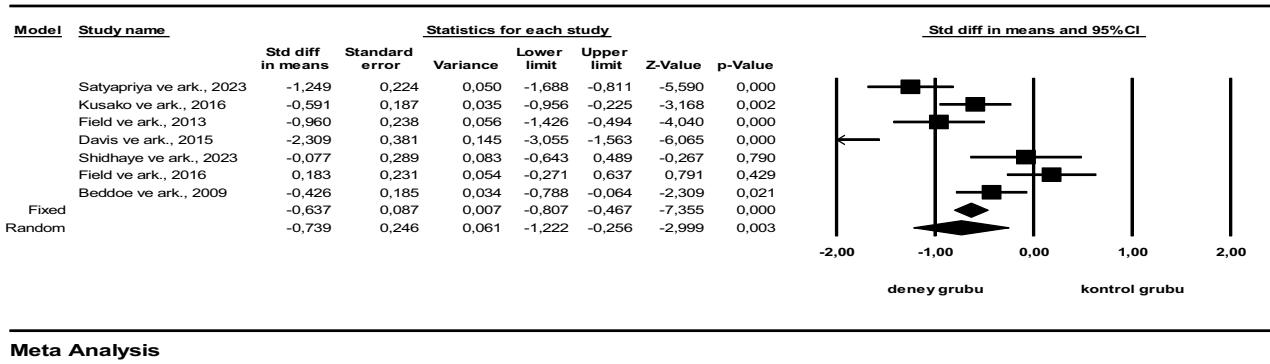

FIGURE 5. Forest plot of the studies.

maternal conditions associated with this time period, such as postpartum depression.

Future research directions

Although the evidence supporting yoga in pregnancy is increasing, methodological weaknesses in published studies and the insufficient number of published randomized controlled trials with reproducible evidence-based interventions highlight the need for further research. Higher-quality studies are needed before the effectiveness of pregnancy yoga interventions for maternal and birth outcomes can be definitively known. Future studies should ensure rigorous trial design and reporting as well as the development of evidence-based interventions.

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