

## Benefits Of Yoga In Pregnancy: Systematic Review

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### ABSTRACT

**Introduction:** Previous research has shown that yoga therapy can be practiced by pregnant women and provides many benefits. It is not clear when yoga was first introduced as a prenatal practice or the current prevalence of yoga practice among pregnant women. **Objective:** This article will discuss the benefits of yoga in pregnancy. **Methods:** This article was prepared using the standards set by *Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA)* 2020, this study shows that it meets all the requirements and the research is up to date. The publications involved were those published between 2013 and 2023. Several different online resources, such as Pubmed and SagePub, were used to do this. **Results:** We retrieved 108 articles from the PubMed database, while our search results on SagePub returned 87 articles. Search results conducted in 2013 returned a total of 45 articles for PubMed and 32 articles for SagePub. In the end, we compiled a total of 28 papers, of which 18 were from PubMed and 10 were from SagePub. We included nine studies which met the criteria. **Conclusions:** Previous research has shown that yoga can provide benefits in terms of reducing the incidence of depression, anxiety, and pain during labor.

**Keywords:** Anxiety, Depression, Pregnancy, Pain, Yoga

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## INTRODUCTION

Yoga is a term derived from the Sanskrit word 'yuj', which means to combine or unite. Yoga is a mind and body practice which includes stretching and posture exercises (asanas) combined with deep breathing (pranayama) and meditation. Yoga requires good coordination of body movements and breathing with a focus on self-awareness. The concepts of yoga are said to be thousands of years old. Yoga was originally propagated in traditional traditions, then composed by Patanjali in the Yoga Sutras around 2000 years ago.<sup>1-3</sup>

The yoga we know today originated in India in the 1820s as a mystical practice practiced only by men in remote forests. In the early 1920s, a researcher named Jagannath Gune turned the practice of yoga into an exercise for health and wellness by establishing the Kaivalyadhama health and yoga research center in India. It wasn't until the late 1930s that yoga became a worldwide phenomenon. and women are allowed to learn yoga and participate. Today, yoga is a widely recognized form of exercise practiced by more than 36 million adults in the United States.<sup>2</sup>

This figure nearly doubled in the decade from 2002 to 2012 and grew by more than 50% in the past four years. More than 70% of yoga practitioners are women, the majority of whom are in the reproductive age group. Hatha yoga or the physical practice of yoga is the most commonly understood thing in the West. There are many styles practiced in the United States and Europe, including Anusara, Ananda, Ashtanga, Bikram, Iyengar, Kundalini, Power, vinyasa flow, Viniyoga, and Yin. Although each style has its own expression, the basic principles are the same with an emphasis on breathing exercises and meditation.<sup>4-6</sup>

It is not clear when yoga was first introduced as a prenatal practice or the current prevalence of yoga practice among pregnant women. The article that we have compiled will discuss the benefits of yoga in pregnancy.

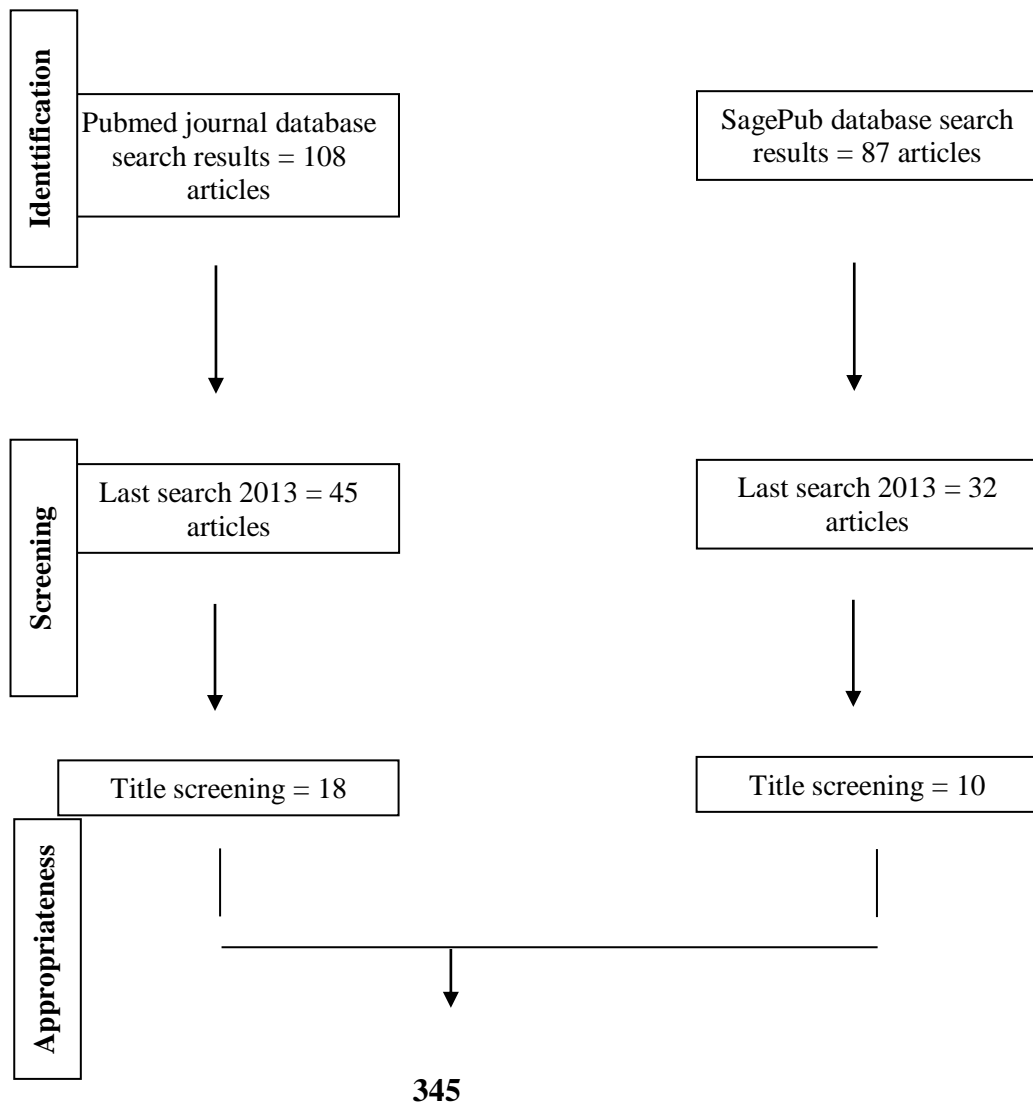
## METHODS

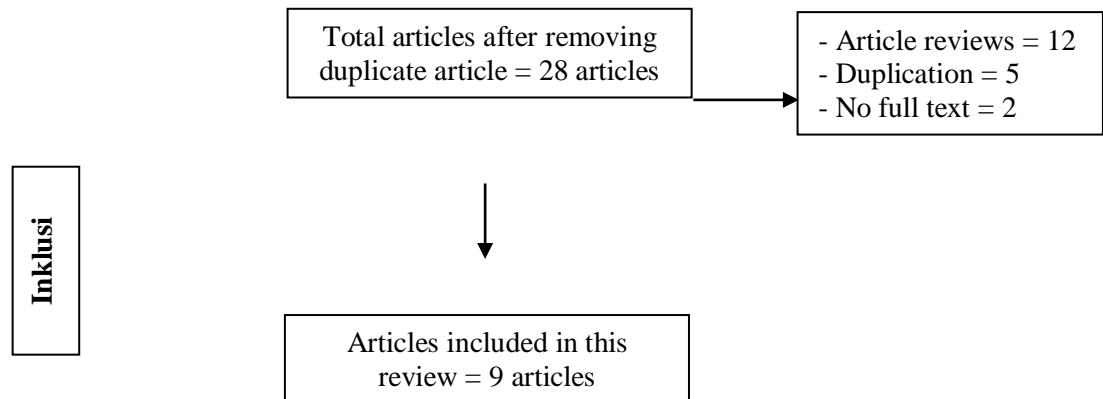
This article follows the guidelines of *Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA) 2020, where we ensure that this article must



comply with the standards. This is done to ensure the accuracy of the findings from the research that will be involved. The purpose of this literature review is to see the benefits of yoga meditation for pregnant women. As the main objective of this paper, the relevance of the identified challenges will be thoroughly demonstrated.

Research that will be included in this article must meet the following criteria: 1) be written in English and demonstrate the benefits of yoga meditation for pregnant women or pregnancy. Manuscripts must fulfill both of these requirements, namely: the article under review was published after 2013 and is in the form of research, whether it is a cross-sectional study, cohort or clinical trial. As for editorials, scientific journals without DOI, and review articles were excluded from the study.





**Figure 1. Flowchart of article searching**

We use "yoga" and "pregnancy" as keywords. The study searching to be included in the systematic review was conducted starting August 15, 2023 using the PubMed and SagePub databases by entering: *((("yoga"[MeSH Terms] OR "yoga"[All Fields]) AND ("pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields])) AND ((y\_10[Filter]) AND (clinicaltrial[Filter]))* used in a literature search.

We determined whether a journal met the inclusion criteria or not after reviewing the abstracts and titles of each study. The author determines which previous studies will be the source of the article and selects those studies. All submitted journals must be written in English and have never been published before. Only publications that met all inclusion criteria were considered for this systematic review. We did not consider any study results that did not meet our criteria.

The results of the research will be analyzed thoroughly. The following information was revealed as a result of research conducted for this study: name, author, date of publication, location, study activities, and parameters. Before deciding which publications to further scrutinize, we conducted a review of the research listed in the title and abstract of the publication. The next step is to evaluate all articles that meet the inclusion criteria for reviews.

Next, we will choose which articles will be included in the review based on the findings. This criterion is used to select documents for additional evaluation. To facilitate as much as possible the selection of papers for evaluation. This section discusses the previous studies that were conducted and what aspects of those studies made their inclusion in the review appropriate.

## RESULTS

We retrieved 108 articles from the PubMed database and 87 articles from SagePub. Search results which conducted in 2013 returned a total of 45 articles for PubMed and 32 articles for SagePub. In the end, we compiled a total of 28 articles, of which 18 were from PubMed and 10 were from SagePub. We included nine studies that met the criteria.

Gavin, et al (2020)<sup>7</sup> showed that maternal heart rate increased significantly during the yoga period ( $102 \pm 11$  beats per minute) compared to rest ( $90 \pm 10$ ), meditation ( $85 \pm 12$ ), and recovery ( $88 \pm 10$ ) ( $p < .01$ ). The maximum maternal heart rate achieved during a yoga session is  $125 \pm 13$  beats per minute. The fetal heart rate (FHR) fluctuated slightly during the yoga session, whereas there were no FHR decelerations that would indicate a significant adverse effect on the fetus. There was no statistically significant difference between fetal heart rates at rest ( $138 \pm 14$  beats per minute), yoga ( $137 \pm 11$  beats per minute), meditation ( $139 \pm 7$  beats per minute), or recovery ( $135 \pm 22$  beats per minute) ( $p = 0.814$ ). Uterine activity was significantly greater during the yoga period compared to other time points ( $p < 0.001$ ).

Tabel 1. Search results

Name, year	Country	Mehtods	Sample	Results
Gavin, 2020 <sup>7</sup>	United States	Cohort prospective	20 healthy pregnant women	Yoga may be recommended for low-risk women during pregnancy because no adverse



				changes in fetal or maternal heart rate are observed during a typical prenatal yoga session.
<b>Jahdi, 2017<sup>8</sup></b>	Iran	Randomized controlled trial	60 primiparous women	Yoga during pregnancy can contribute in reducing labor pain.
<b>Babbar, 2016<sup>9</sup></b>	United States	Randomized controlled trial	52 pregnant women	There were no significant acute changes in fetal blood flow after practicing yoga for the first time in pregnancy. Yoga may be recommended for low-risk women to start during pregnancy.
<b>Rakhshani, 2015<sup>10</sup></b>	India	Randomized controlled trial	59 high-risk pregnant women randomized into groups of yoga (n = 27) and control (n = 32)	The results of this first randomized study of yoga in high-risk pregnancies demonstrate that guided yoga practice and visualization can improve intrauterine fetal





				growth and utero-fetal-placental circulation.
<b>Polis, 2015</b> <sup>11</sup>	United Kingdom	Cohort prospective	25 healthy pregnant women	All (26 types) of yoga postures were well tolerated without adverse maternal physiological or acute fetal heart rate changes.
<b>Martins, 2014</b> <sup>12</sup>	Brazil	Randomized controlled trial	60 pregnant women	The yoga method is more effective in reducing the intensity of lumbopelvic pain than the postural orientation.
<b>Bershadsky, 2014</b> <sup>13</sup>	United States	Cross sectional	51 pregnant women	Prenatal yoga can elevate mood and is effective in reducing symptoms of postpartum depression.
<b>Ko, 2013</b> <sup>14</sup>	Taiwan	Pretest-post-test one group quasi-experimental	28 women at 2-6 months postpartum	Yoga gives benefits in postpartum women's physical and mental health and can improve their quality of life.
<b>Deshpande, 2013</b> <sup>15</sup>	India	Randomized controlled trial	68 pregnant women (38 in	Yoga therapy modules can reduce



			<p>the control group with standard antenatal care and 30 in the yoga group)</p>	<p>stress levels during high-risk pregnancy complications. The practice of yoga therapy during high-risk pregnancies is not only a cost-effective option but also a viable and safe option.</p>
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Jahdi, et al (2017)<sup>8</sup> showed that the control group reported higher pain intensity at 3-4 cm opening ( $p = 0.01$ ). Mothers in the antenatal intervention group who completed yoga classes required a decrease in labor induction frequency compared to the control group ( $p = 0.008$ ). In addition, the method of delivery in the intervention group resulted in a lower percentage of cesarean sections than the control group ( $p = 0.002$ ). Finally, the intervention group experienced a shorter duration of second and third stage of labor.

Babbar, et al (2016)<sup>9</sup> showed that there were no clinically significant changes in the ratio of umbilical artery systolic and diastolic ( $P = 0.34$ ), pulsatility index ( $P = 0.53$ ), or resistance index ( $P = 0.66$ ) between the two groups before and after the intervention. Fetal and maternal heart rates, maternal blood pressure, and uterine artery Doppler remained unchanged over time. There was no difference between those who improved or worsened between groups, when the individual umbilical artery indices were compared to reference gestational age

Rakhshani, et al (2015)<sup>10</sup> showed significantly higher values for biparietal diameter ( $P = 0.001$ ), head circumference ( $P = 0.002$ ), femur length ( $P = 0.005$ ), and estimated fetal weight ( $P = 0.019$ ) in patients with who underwent yoga therapy (week 28). Resistance indices in the right uterine artery ( $P = 0.01$ ), umbilical artery ( $P = 0.011$ ), and fetal middle cerebral artery ( $P = 0.048$ ). This showed significantly lower impedance in the yoga group.





Polis, et al (2015)<sup>11</sup> showed that there was no change in maternal heart rate, temperature, pulse oximetry, or fetal heart rate during pre-session and post-session data collection. Vital signs, pulse oximetry, and uterine tocometry remained normal in all women and all postures. The fetal heart rate in all the yoga postures performed is normal. No falls or injuries for a total of 650 cumulative poses. None of the participants reported decreased fetal movement, contractions, fluid leakage, or vaginal bleeding within 24 hours of follow-up.

Martins, et al (2014)<sup>12</sup> showed that the median pain score of patients who underwent yoga was lower than the group in the postural orientation ( $p < 0.0058$ ). The lumbar pain provocation test showed decreased responsiveness in relation to the posterior hip pain provocation test and a gradual decrease in pain intensity over 10 yoga sessions ( $p < 0.024$ ). The yoga method is more effective in reducing the intensity of lumbopelvic pain than the postural orientation.

Bershadsky, et al (2014)<sup>13</sup> showed that cortisol levels were lower ( $p < 0.01$ ) and positive affect was higher ( $p < 0.001$ ) in yoga compared to ordinary activities. Negative affect and satisfaction ( $p < 0.05$ ) were further increased in response to the yoga session. Yoga group participants showed fewer postpartum ( $p < 0.05$ ), but not antepartum depressive symptoms than control group participants. The findings suggest that prenatal Hatha yoga can improve current mood and may be effective in reducing symptoms of postpartum depression.

Ko, et al (2013)<sup>14</sup> showed that women in the high score group showed a significant reduction of  $6.71 \pm 5.71$  points ( $t = 3.113$ ,  $p = 0.021$ ) in depression scores after participating in this yoga practice program. No significant difference was found in the level of fatigue before and after the exercise program ( $p > 0.05$ ). Significant reductions in participants' body weight, body fat percentage, fat mass and baseline metabolic rate were observed after the exercise program ( $p < 0.001$ ).

Deshpande, et al (2013)<sup>15</sup> showed a significant difference in the Perceived Stress Scale (PSS) level of the yoga therapy group with a significantly reduced score at the second follow-up (28th week of pregnancy) compared to the control group ( $P = 0.02$ ). Women who took part in yoga therapy reported significantly less reduction in pregnancy





discomfort in PSS ( $P = 0.02$ ) than controls where stress levels were increased. This study shows that the yoga therapy module can reduce stress levels in high-risk pregnancy complications.

## DISCUSSION

The health benefits of yoga are said to be numerous, such as reducing stress, anxiety, depression, chronic back pain, migraines, and may be beneficial in conditions such as hypertension and diabetes. Pranayamic breathing also known as deep breathing, is where one manipulates the breathing movements voluntarily and serves as the foundation of any yoga practice<sup>16</sup> Slow, intentional, and deep breathing activates the parasympathetic nervous system primarily by stretching the lung tissue and vagal nerves. This causes a physiological response characterized by a decrease in heart rate, blood pressure, metabolic rate, and oxygen consumption.<sup>17</sup>

Deep breathing also increases neuroplasticity causing reorganization of neural pathways as an adaptive response. Studies show increased neuroplasticity in those who practice yoga, thereby increasing concentration and motor control. This makes yoga useful for women in pregnancy.<sup>18</sup> Natural physiological adaptations that occur in pregnancy such as those due to increases in cardiac output, heart rate, and plasma volume may be countered by deliberate parasympathetic activation during yoga. Research shows an increase in autonomic responses to stress in healthy pregnant women who practice yoga during their pregnancy.<sup>19</sup>

The evidence which shows the benefits of yoga in pregnancy continues to increase. The pregnancy-related factors most frequently assessed included stress, anxiety, depression, pain of pregnancy and labour, sleep, and pregnancy outcomes.<sup>18</sup> Depression is the most common occurrence in pregnancy, in which up to 50% of women during pregnancy. Most of the prenatal yoga studies revolve around assessing depression and anxiety during and after pregnancy. Research shows significant reductions in depression and anxiety after intervention during pregnancy, which also persist into the postpartum period.<sup>4,13,20-22</sup>





One of the most common complaint of pregnancy is progressive low back pain, particularly in the lumbosacral region. Exercises that focus on stretching and strengthening the back and abdominal muscles are often recommended to relieve pregnancy-related pain. Martins et al concluded that 1 hour a week of Hatha yoga practice for 10 weeks can significantly reduce low back pain during pregnancy. More frequent yoga practice 3 times per week for 30 minutes each over a period of 12 to 14 weeks has also been shown to have similar findings in pain reduction during pregnancy.<sup>12</sup>

High-risk pregnancies occurs for about 6-8% of all pregnancies in the United States. Certain medical conditions such as gestational diabetes and hypertension can potentially benefit from practicing yoga in pregnancy. The high-risk cohort was defined as those with any of the following: previous history of pregnancy-induced hypertension, preeclampsia, growth restriction; extreme age; obesity; twin pregnancy; or a family history of poor obstetric outcomes. Simple yoga meditation practice three days a week for 16 weeks of pregnancy resulted in significant benefits when compared to controls.<sup>10,15,20</sup>

Significantly fewer women in the yoga group had hypertensive disorders at index pregnancy and had lower rates of fetal growth restriction and Doppler changes. The women in the yoga group also maintained normal uric acid and platelet levels throughout their pregnancy, thereby reducing the risk of developing hemolysis, elevated liver enzymes, low platelet count syndrome. They also experienced much lower levels of pregnancy stress and discomfort during pregnancy.<sup>10,15,20</sup>

The side effects of yoga in pregnancy are not well reported in the literature. Yoga is a low-impact and easy-to-modify exercise which makes it more likely to be a safe endeavor with minimal injury. Previous studies have not reported maternal injury during their study period in those who practice yoga.<sup>9,23</sup> The risk to the fetus is also unknown and not well documented. The randomized controlled trial conducted by Babbar et al assessed the acute response of the fetus to prenatal yoga.<sup>9</sup>

Women new to yoga undergo standard antenatal fetal testing before and after a one-hour yoga class. Acute fetal behavior as assessed by umbilical artery Doppler, nonstress test and biophysical profile parameters, compared with stationary control group.





There were no significant differences in fetal parameters or delivery outcomes in this cohort. Another study assessing acute fetal response to controversial yoga poses in the third trimester concluded similar findings. Short-term fetal tolerance of yoga practice in pregnancy has been demonstrated<sup>9,11,19</sup>

## RESULTS

Prenatal yoga exercise has been shown to benefit women who suffer from anxiety, depression, stress, low back pain and sleep disturbances. A small number of studies have been conducted in high-risk pregnancies that have also shown improved outcomes. The safety of doing yoga for the first time in pregnancy and fetal tolerance have been demonstrated.

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