**OBGYN - Yoga in Labor and delivery outcomes**

A19 y/o G1P0 female with no significant PMHx was seen in the low- risk clinic for her prenatal

care. Pt is 36 2/7 weeks pregnant. Her prior prenatal care was done in Guyana. She was due for a GBS and GC swab today. The FHR was 145 and fundal height was measured at 35 cm. She is an active and health-conscious woman. She does a lot of yoga and heard from her friends and others who have been pregnant and do yoga that they felt that childbirth was easier and faster for them.

The patient was curious and wanted to know if yoga can help make the actual process of childbirth easier.

**Clinical Question**: Can practicing yoga during pregnancy lead to better outcomes (shorter duration of labor and pain reduction) during labor and delivery?

**PICO search terms:**

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| **P** | **I** | **C** | **O** |
| Pregnant women who practice yoga | Yoga | Pregnant women that do not practice yoga | Improved pregnancy outcomes |
| Primigravida women who practice yoga |  | Primigravida women who do not practice yoga | Shortened duration of labor and delivery |
| Multigravida women who practice yoga |  | Multigravida women who do not practice yoga | Pain improvement during labor and delivery |
|  |  |  | Improved maternal outcome during labor |

**SEARCH TOOLS & LIMITS**

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| **Database** | **Filter** | **Terms Searched** | **Articles Returned** |
| **PubMed** | 1. English, 2005-2022 Clinical Trials/ Meta-analysis/ RCT/ Systematic review  2. English, 2000-2022 Clinical Trials/ Meta-analysis/ RCT/ Systematic review  3. English, 2005-2022 Clinical Trials/ Meta-analysis/ RCT/ Systematic review | “Does yoga improve labor and delivery”    “Can Yoga reduce labor pain”    “Effects of yoga on labor and delivery” | * 17 * 6 * 15 |
| **PMC/NCBI** | 1. Open access/ 10 years  2. Open access/ 10 years | “Does yoga improve labor and delivery”    “Effects of yoga on labor and delivery” | * 2467   ·      2593 |
| **Cochrane library** | 1. Title, abstract, Keyword/ English 2000-2022  2. Title, abstract, Keyword/ English 2000-2022 | “Yoga improve labor and delivery”    “Effects of yoga on labor and delivery” | * Cochrane Reviews (1) * Trials (6)        * Cochrane Reviews (2)   Trials (22) |
| **Google Scholar** | 1. 2010 -2022  2. Review Articles | “Does yoga reduce labor and delivery time” | * 3,660 |
| **Wiley Online Library** | 1. Journals  2. Last 5 years | “Does yoga improve labor and delivery” | * 220 |

For this study, I made my questions more general as the population I am reviewing are pregnant women in general (not high-risk vs low risk etc.) I chose these 5 databases because they have been good resources and provide a fairly good number of results usually during my searches. I used 2-3 search terms mostly for each database because I wanted to try to get wider and more extensive information on the effects of yoga on labor and delivery (different outcomes that yoga can have besides shortening the duration of L&D and improving pain). I skimmed through the titles and abstracts of the articles in these databases up to the first 5 pages and then decided to choose articles from PubMed and Cochrane as they usually have more filters and provide more specific results. After this I decided to read through the Abstracts for articles that seemed to focus more on my study question before selecting the 3 most resourceful articles I chose to use for my Pico which included a systematic review, ,meta-analyses and a RCT.

**Article 1:  The effectiveness of prenatal yoga on delivery outcomes: A meta-analysis**

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| **Citation**: Rong L, Dai LJ, Ouyang YQ. The effectiveness of prenatal yoga on delivery outcomes: A meta-analysis. *Complement Ther Clin Pract*. 2020; 39:101157. doi:10.1016/j.ctcp.2020.10115 |
| **Type of Study: Meta-Analysis** |
| **Abstract**    **Background:**The efficacy of yoga on delivery outcomes remaining controversy    **Objectives:**To evaluate the effects of prenatal yoga on delivery outcomes.    **Methods:**The Cochrane Library, PubMed, Embase, Web of Science, CINAHL and Elsevier databases were searched from inception to January 22, 2020, and randomized, quasi-randomized and non-randomized controlled trials evaluating the effect of yoga on the delivery outcomes in pregnant women were included. The methodological quality was assessed by the Cochrane Collaboration's tool. Meta-analysis was performed using Revman 5.3.    **Results:**This meta-analysis identified that yoga improved vaginal delivery, decreased premature delivery and birth weight of newborns, shorten the labor duration.    **Conclusion:**Prenatal yoga is an effective complementary medicine to improve delivery outcomes and not to increase the risk of fetus, which is worth recommending to pregnant women. But studies involved in this meta-analysis were not all of high quality. The Registration Number in PROSPERO is CRD42019132490. |
| **Reason for Selection**: I chose this article because it is meta-analysis which provides a higher level of evidence, and this is also a fairly recent article which should include more updated studies and trials such as RCTs. I chose this article also because it follows the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. It also involved a larger number of databases including PubMed, Cochrane library, Embase etc. The study also explored a wide variety of clinical outcomes in patients (including both primiparous and multiparous) such as duration of L&D, vaginal delivery rates etc. |
| **Key points:**   * 108 articles were identified but 7 studies (5 RCTs and 2 Non-randomized controlled trials) were included in the final analysis with an inclusion of 808 pregnant patients * The women included in the study were healthy pregnant women without anticipated pregnancy complications and had no previous yoga experience or had not practiced yoga in the last year. * They also took steps to reduce the risk of bias such as publication bias * The study extracted data on the following outcomes: vaginal Delivery, premature delivery, gestational weeks, duration of labor. * They found that vaginal delivery rate was higher in the intervention group. They also found that premature delivery rate was lower in the intervention groups. There wasn’t significant difference found in terms of gestational weeks. The effects on labor duration were that labor duration was shorter in the intervention group. * Most of the studies included patients engaging in yoga between 2x a week – daily, and for a period of between 10 weeks to 20 weeks. * Some of the studies also showed that yoga may also be just as beneficial for both primiparas and multiparas. * One of the studies included in the article discussed how implementing yoga exercises for about 10 weeks could have a considerable effect on shorting the 2nd and 3rd stages of labor and reducing the need for cesarean section. |
| **PDF Link:**https://www.sciencedirect.com/science/article/abs/pii/S1744388119308503?via%3Dihub |

**Article 2: Yoga during pregnancy: The effects on labor pain and delivery outcomes (A randomized controlled trial)**

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| **Citation**: Jahdi, Sheikhan, F., Haghani, H., Sharifi, B., Ghaseminejad, A., Khodarahmian, M., & Rouhana, N. (2016). Yoga during pregnancy: The effects on labor pain and delivery outcomes (A randomized controlled trial). Complementary Therapies in Clinical Practice, 27, 1–4. https://doi.org/10.1016/j.ctcp.2016.12.002 |
| **Type of Study: Randomized Controlled Trial** |
| **Abstract**    **Objective**  To investigate the effects of an antenatal yoga program on perceived maternal labor pain and delivery outcomes.  **Material & Methods**: This randomized control trial was conducted with sixty [primiparous women](https://www-sciencedirect-com.york.ezproxy.cuny.edu/topics/medicine-and-dentistry/primiparous-woman), aged 18–35 years old, who were randomly assigned to either an antenatal yoga program or control groups. Labor pain and discomfort level of the participants were measured using a [Visual Analogue Scale](https://www-sciencedirect-com.york.ezproxy.cuny.edu/topics/medicine-and-dentistry/visual-analog-scale) at [cervical dilatation](https://www-sciencedirect-com.york.ezproxy.cuny.edu/topics/medicine-and-dentistry/uterine-cervix-dilatation) of 3–4 c and at 2 and 4 h after the initial measurement. Demographic and obstetrical information were collected. The antenatal yoga program consisted of a 1-h supervised yoga class, three times a weekly, starting at 26 weeks’ gestation.    **Results**  Participants in control group reported higher pain intensity compared to experimental group at 3–4 cm of dilatation (p = 0.01) and at 2 h after the first and the second measurements (p = 0.000). Mothers in the antenatal intervention group that completed the yoga class required a decreased frequency of labor induction in comparison with control group (p = 0.008). In addition, mode of delivery of the intervention group resulted in a lower percentage of [cesarean section](https://www-sciencedirect-com.york.ezproxy.cuny.edu/topics/medicine-and-dentistry/cesarean-section) than control group (p = 0.002). Lastly, the intervention group experienced a shorter duration of the second and third stages of labor. Interval level data was analyzed by using an independent *t*-test and chi-square.    **Conclusion**  Yoga during pregnancy may contribute to a reduction pain of labor and improved adequacy of [childbirth](https://www-sciencedirect-com.york.ezproxy.cuny.edu/topics/medicine-and-dentistry/childbirth). |
| **Reason for article**: I chose this article because it is a randomized controlled trial which is a stronger source of evidence, and it explores the effects of Yoga on pain during labor and delivery which I thought would be important to explore as that is something that some patients are concerned about and was discussed but not explored as much in the previous systematic review. |
| **Key Points:**   * The study includes 60 non-high risk primiparous women between the age of 18-35 years old who had never done yoga and other exercise such as Pilates or tai chi. * Labor pain was measured with the use of a visual analogue scale * The program involved an antenatal yoga program that involved 1 hour supervised yoga classes 3x a week from 26 weeks of gestation. * Pain was measured in both groups when cervical dilatation reached 3-4 cm, then at 2 hrs and 4 hrs. * The study found a decrease in the rate of cesarean section in the intervention group. They also found that the women who performed yoga had low levels of perceived labor pain during the active labor phase. * I did not think this was this study very strong as the participant size was quite small, but the findings do correlate with that of the meta-analysis and other studies. |
| **Pdf link:** https://pdf.sciencedirectassets.com |

**Article 3: The Effect of Prenatal Yoga on Birth Labor Duration and Pain: A Meta-Analysis**

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| **Citation**: Riawati, M. S., Budihastuti, U. R., & Prasetya, H. (2021). The Effect of Prenatal Yoga on Birth Labor Duration and Pain: A Meta-Analysis. *Journal of Maternal and Child Health*, *6*(3), 327-337 |
| **Type of Study: A Meta-analysis** |
| **Abstract**:  **Background:** Increased psychological burden during pregnancy can cause problems with the quality of the fetus and cause complications in pregnancy. The lack of knowledge about labor pain management and the mother's perception of prolonged labor makes the mother experience an increase in the psychological burden during pregnancy. One alternative therapy needed in dealing with a happy pregnancy and minimal trauma delivery is to do prenatal yoga. The purpose of this study was to estimate the magnitude of the effect of prenatal yoga on the duration of labor and labor pain.  **Subjects and Method:** This study uses a systematic review and meta-analysis research design. The time of the selected test results is between 2005 to 2021. The search for articles is carried out for 1 month. Research data was searched from databases: PubMed, Science Direct, Springer Link, Google Scholar, Chocrance Library. The inclusion criteria in this study were full text articles in English, the study design used a randomized controlled trial. Article searches were carried out using the PICO model. The population in this study were pregnant women, the intervention was in the form of prenatal yoga, comparison was without prenatal yoga, and the outcomes were labor duration and labor pain. Data processing is carried out using the Review Manager (RevMan 5.3) by calculating the standardized mean diffe- rence to determine the combined research model and form the final result of the meta- analysis.  **Results:** There are 9 articles in the study of the effect of prenatal yoga on the duration of labor and there are 5 articles on labor pain. The study showed that prenatal yoga significantly reduced labor duration (SMD= 0.88; 86% CI -1.31 to - 0.44 p<0.001). Prenatal yoga can also reduce labor pain (SMD = 0.88; 77% CI -1.44 to -0.33 p = 0.002).  **Conclusion:** Prenatal yoga can reduce labor duration and reduce labor pain. |
| **Reason for Selection:**  I chose this article because it is a fairly recent article and a systematic review as well which would be a higher level of evidence. It also draws data from different databases and includes RCTs. They also use the PRISMA guideline |
| **Key Points:**   * This study includes 9 articles which focus on the effects of prenatal yoga on the duration of labor and 5 of which focused on labor pain. The number of participants used for each study was between 22 -169 (Intervention and control group combined) * They found that prenatal yoga reduced the duration of labor and that the perception of pain by patients was also reduced. * One of the studies discussed how doing yoga 30 mins a day - 3 times a week could result in the outcomes mentioned (reduced labor pain and shortened duration of labor) |
| **PDF link:**https://pubmed.ncbi.nlm.nih.gov/34763445/ |

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| Author (Date) | Level of Evidence | Sample/Setting (# of subjects/ studies, cohort definition etc.) | Outcome(s) studied | Key Findings | Limitations and Biases |
| Rong L, Dai LJ, Ouyang YQ (2020) | Meta- Analysis | 1. The study used the PRISMA guidelines and included databases such as Web of science, PubMed, Cochrane library, Embase, CINAHL, and Elsevier.  2. The databases were searched from as far as October 1987 – January 22, 2020, using search terms such as delivery outcome, birth outcome, childbirth outcome, and Yoga.  3. They included published randomized, quasi-randomized, and non-randomized control trials. The studies with the following criteria were used:  a. Participants: Healthy pregnant women without any pregnancy complications and no yoga experience or have practiced yoga in the last year  b. Intervention: Yoga exercise  c. Comparisons: routine prenatal healthcare or other exercises  d. Outcomes: Vaginal delivery rate, premature delivery rate, birth weight of newborn, gestational weeks, Apgar score and labor duration  4. In summary, 182 articles were initially identified and only 7 (five RCT and 2 non-randomized controlled trials) met the inclusion criteria for this meta-analysis. Of these a total of 808 pregnant women were participants. Length of studies were between 10-20 weeks. | 1. Outcomes: Vaginal delivery rate, premature delivery rate, birth weight of newborn, gestational weeks, Apgar score and labor duration | 1. Vaginal delivery: Vaginal delivery rate was significantly higher in intervention groups (OR= 1.71, 95% Cl [1.24-2.37], P = 0.001)    2. Premature delivery: Premature delivery was significantly lower in the intervention groups (OR= 0.46, 95% Cl [0.28-0.74], P = 0.002)    3. Gestational weeks: There was no significant difference in gestation weeks (p = 0.37)    4. Birth weight of newborn: birth weight was significantly lighter in the intervention group (MD = -169.71, 95% Cl [-255.6.28 to – 83.81], P = 0.0001)    5. Apgar Score: There was no significant effect on Apgar score (p = 1.00)    6. Labor Duration: Labor duration was significantly shorter in the intervention group compared to the control groups. (MD = -120.78, 95% Cl [-166.33 to – 75.23], P < 0.00001) | 1. From the 7 articles used for the meta-analysis. 6 studies were determined to have low risk of attrition bias and reporting bias while one study had high risk for both. No significant publishing bias was noted for all studies.  2. This Meta-analysis may have possible selection bias as articles used were only in English and Korean. |
| Jahdi, Sheikhan, F., Haghani, H., Sharifi, B., Ghaseminejad, A., Khodarahmian, M., & Rouhana, N. (2016). | Randomized Controlled Trial | 1. Single Blind randomized study performed in Iran from March 2013 - June 2014.  2. The study includes 60 Primiparous women without serious illness or high-risk of complications without previous experience with yoga were recruited from antenatal visits | 1.Age, bmi, education, economic status, job experience, duration of first and second and third stages of labor, induction, birth mode, analgesia consumption, labor pain, newborn birth weight and Apgar scores. | 1. In terms of demographics the were no significant differences between the intervention and control groups in age, BMI, education and economic status.  2. Analgesic use: No difference in analgesic use between the yoga group and control group during the first stage of labor. (p = 0.2)  3. Apgar Scores: no statistical difference between the groups ( p> 0.05)  4. New born birth weight no statistical difference between the groups ( p> 0.05)  5. Labor duration: 2ndand 3rd stages were shorter in the yoga group compared to the control group (p = 0.04 and 0.01 respectively)  6. Labor pain: pain scores in the yoga group were significantly less when cervical dilation reached 3-4cm (p = 0.01).  7. Cesarean section rate: decreased in the yoga group compared to the control group (13.3% vs 50% respectively)  8. Induction: planned induction was significantly lower in the yoga group (29.3% vs 56.7%) | 1. Small sample size of participants (60)  2. The study was performed in 1 gynecology clinic only |
| Riawati, M. S., Budihastuti, U. R., & Prasetya, H. (2021) | Systematic Review & Meta- Analysis | 1. This study also follows the PRISMA guidelines and PICO model.  2. Timeline of included RCTs (English) was between 2005-2021 and the databases used to obtain articles were PubMed, Science Direct, Springer link, Google scholar and Cochrane Library.  3. A total of 9 articles were included for the systematic review and meta-analyses of which the 9 focused on duration of labor and 5 articles on labor pain. The 9 articles were from studies conducted in (Indonesia, Iran, India, Thailand, Australia)  4. The study participants were 765 pregnant women. | 1. Labor duration (how long it takes for normal delivery) and labor pain.  2. Labor pain | 1. Labor duration: The practice of prenatal yoga shows a significant reduction of labor duration in pregnant women (p< 0.001). A forest plot was used.  2. Labor pain (forest plot): Prenatal yoga was shown to significantly reduce labor pain by 0.88 times in pregnant women compared to the control group (p = 0.002) | 1. There was no risk of publication bias noted. |

**Summary of the Evidence**

 Article 1: This Meta-analysis studies outcomes in vaginal delivery rate, premature delivery rate, birth weight of newborn, gestational weeks, Apgar score and labor duration with the last outcome answering part of the question listed in my original clinical question. The outcomes for labor duration as stated above showed that the duration of labor is shorter in the group that did practice yoga. The other outcomes as listed above did go to show that yoga is an effective complimentary therapy in pregnant women that could help promote vaginal deliveries, may decrease premature deliveries, and could help shorten the first and second stages of labor duration. The article does suggest that breathing exercise in yoga may help pregnant women maintain a calm and relaxed state during delivery. Prenatal yoga promotes strength and flexibility of key muscles such as the pelvic floor muscles and it may also be conducive for the meeting the power-flexibility needs for delivery and promote a smooth delivery. Yoga has also been shown in other studies to help reduce prenatal anxiety symptoms. Yoga also has not been seen to have any negative effects on the fetus.

Article 2: This RCT I chose because RCTs are usually a higher level of evidence for research. This study made use of a supervised yoga program during pregnancy and was conducted for a time frame of about 10-11 weeks. The summary of the key findings of the article as listed above shows that the women who performed yoga during pregnancy reported lower labor pain scores during the active phase of labor (labor pain is one of the outcomes included in my original clinical question that was not explored in article 1). The study also found less of a need for induction in the yoga group, and a reduction the rate of cesarean section. They suggest that yoga training 3x a week for 1 hour around the 27th -36th weeks of pregnancy may encourage the promotion of the positive outcomes discussed.

Article 3: This is a systematic review and meta-analysis and includes more studies in comparison to Article 1, however the actual number participants is slightly smaller. This article focuses on the outcomes I listed in my clinical question which were labor pain and duration. The study finds that Yoga could reduce the duration of labor significantly in pregnant patients (also the same finding in article 1). In terms of labor pain the 5 articles on the this showed that prenatal yoga practice was able to reduce labor pain significantly as well in comparison to women who do not practice pre-natal yoga. One of the 9 studies recommended that pregnant women should practice yoga for 30 mins a day and do it 3x a week to shorten the duration of labor.

**Conclusion:**

My overall conclusion is that prenatal yoga can help reduce the duration of labor and delivery and can also reduce the perception of labor pain in pregnant women who engage in yoga compared to those who do not. It also provides other benefits as discussed in the summary above and the discussions below. Based on some of the recommendations discussed above and the timeline of most of the studies used I think encouraging prenatal yoga in pregnant patients 3x a week for 30 minutes for at least 10 weeks may be beneficial to patients

**PICO Question**: Can practicing yoga during pregnancy lead to better outcomes (shorter duration of labor and pain reduction) during labor and delivery?

**Clinical bottom line**

The first article which is the Meta-analysis seemed to show that there were many beneficial outcomes seen in healthy pregnant patients (without risk factors) who engaged in yoga during their pregnancy which included an increase in vaginal delivery rate, reduction in premature delivery rate, reduction in the duration of labor compared to the control group. I think this and article 3 are the strongest in evidence from my choices, particularly article 3. Articles 2 showed that yoga may also show some promise in reducing labor pain and duration although the study is not as strong as the meta-analyses and review. I think all 3 articles show that Yoga may serve as a promising and resourceful form of complementary and alternative therapy in pregnant patients. Breathing exercises done in Yoga may help improve calmness and reduce stress in patients. As it was not found to pose any harms or risks to patients and the fetus, I think it would be safe to recommend that patients engage in yoga during their pregnancy and prior to birth.

**Weight of Evidence:**

Article 2 > Article 9 > RCT

Based on the hierarchy of strength of evidence I think Article 2 would be a highest level of evidence as it is also a meta-analysis. In addition, it also includes more studies (9) as opposed to 7 in article 1. The studies in this study are also randomized RCT while those in article 1 are a combination of RCT, and non-randomized control trials. Article 3 is also a very recent study which would make it more possible for articles included in the search to be the more up to date studies. The first article I feel comes next in significance and is also a recent article as well as explores many more outcomes for prenatal yoga, For the RCT I think a larger sample size and more organized wide scale study would have been beneficial to improve the strength of the study.

**Magnitude of Effects**:

**Article 1: Rong L, Dai LJ, Ouyang YQ (2020)**

Vaginal delivery: Vaginal delivery rate was significantly higher in intervention groups (OR= 1.71, 95% Cl [1.24-2.37], P = 0.001). Premature delivery: Premature delivery was significantly lower in the intervention groups (OR= 0.46, 95% Cl [0.28-0.74], P = 0.002) Gestational weeks: There was no significant difference in gestation weeks between both groups (p = 0.37). Birth weight of newborn: birth weight was significantly lighter in the intervention group (MD = -169.71, 95% Cl [-255.6.28 to – 83.81], P = 0.0001). Apgar Score: There was no significant effect on Apgar score between both groups (p = 1.00) Labor Duration: Labor duration was significantly shorter in the intervention group compared to the control groups. (MD = -120.78, 95% Cl [-166.33 to – 75.23], P < 0.00001)

**Article 2: Jahdi, Sheikhan, F., Haghani, H., Sharifi, B., Ghaseminejad, A., Khodarahmian, M., & Rouhana, N. (2016).**

Analgesic use: No difference in analgesic use between the yoga group and control group during the first stage of labor. (p = 0.2). Apgar Scores: no statistical difference between the groups ( p> 0.05). New born birth weight no statistical difference between the groups ( p> 0.05). Labor duration: 2nd and 3rd stages were shorter in the yoga group compared to the control group (p = 0.04 and 0.01 respectively). Labor pain: pain scores in the yoga group were significantly less when cervical dilation reached 3-4cm (p = 0.01). Cesarean section rate: decreased in the yoga group compared to the control group (13.3% vs 50% respectively). Induction rate: planned induction was significantly lower in the yoga group (29.3% vs 56.7%).

**Article 3: Riawati, M. S., Budihastuti, U. R., & Prasetya, H. (2021)**

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| Labor duration: The practice of prenatal yoga shows a significant reduction of labor duration in pregnant women (p< 0.001). A forest plot was used. |

Labor duration: The practice of prenatal yoga shows a significant reduction of labor duration in pregnant women (p< 0.001) based on forest plot. Labor pain (using forest plot): Prenatal yoga was shown to significantly reduce labor pain by 0.88 times in pregnant women compared to the control group (p = 0.002)

**Clinical Significance**

Yoga can be seen to help relaxation, improve flexibility, breathing, can help with improving pelvic floor muscles, flexibility of the perineum and vaginal muscles which in turn may help improve the outcomes in delivery in pregnant women in terms of pain and labor duration. It also seems to show promise in other areas as shown above in the table of key findings (increase in vaginal delivery rate, reduction in induction rates, reduction in premature delivery, reduction in cesarean delivery). I think prenatal yoga can be encouraged as it is not an invasive procedure and has not been shown to pose risk to the fetus.

**Other considerations important in weighing this evidence to guide practice**

I think it may be important to note that in some of these studies (e.g., the meta-analysis), the articles included have different timelines at which participants began to practice yoga and the frequency and intensity of training varies so that should be factored into any recommendations and interpretation of the studies as the timeline of practice of yoga could potentially have other outcomes (less effective). More studies on prenatal yoga and the timeline for practicing it may help provide more insight in this area.