Yoga to Decrease Depression among Depressed Pregnant Women

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Abstract

Depression is a prominent cause of global morbidity, and one of the most common medical conditions during pregnancy. Prenatal depression can lead to detrimental outcomes including preterm birth, low birth weight, and postpartum depression. Screening for depression is recommended at least once during the perinatal period. However, even after a diagnosis of depression, several barriers to treatment exist, including cost and patient opposition to treatment. This literature review examines the effectiveness of yoga practice in pregnant women who are depressed or have depressive symptoms. Five research articles published within the last five years were selected that support a yoga practice innovation for prenatal depression management. The utility of yoga is demonstrated in these articles in clinically depressed pregnant women and pregnant women with symptoms of depression or anxiety. A yoga practice protocol shown to be effective in prenatal depression was replicated, and based on that protocol, this paper proposes that clinics that care for depressed pregnant women employ an evidence-based yoga intervention spanning twelve weeks with a minimum of twice weekly yoga practice. Research has shown that yoga practice is safe, efficacious, practical, and decreases prenatal depressive symptoms. Future research should include the diverse demographics of socioeconomic status, prenatal care access, and ethnicity of depressed pregnant women to strengthen the data supporting yoga practice for prenatal depression management.
Yoga to Decrease Depression among Depressed Pregnant Women

Introduction

Depression is a leading cause of global morbidity, and one of the most common medical conditions during pregnancy (Centers for Disease Control and Prevention [CDC], 2013). According to the National Survey on Drug Use and Health, approximately 7.7% of pregnant women had at least one major depressive episode per year from 2005 to 2009 (Ko, Farr, Dietz, & Robbins, 2012). Unipolar major depression is a disorder characterized by symptoms lasting for at least two weeks, and including five of more of the following symptoms: depressed mood, loss of interest or pleasure in activities, insomnia or hypersomnia, change in appetite or weight, psychomotor agitation, low energy, poor concentration, thoughts of worthlessness, and recurrent thoughts about death (Buttarro, Trybulski, Bailey, & Sandberg-Cook, 2013). Even after a prenatal depression diagnosis, several barriers to treatment exist including cost, patient opposition to treatment, and stigma (CDC, 2013). Untreated depression can lead to poor lifestyle behaviors including poor nutrition, smoking, drinking, and suicidal behavior (Farr & Bish, 2013). Unhealthy behaviors linked to depression create a hostile environment for both the pregnant woman and the fetus.

Subsequently, depression during pregnancy can lead to various deleterious outcomes. These outcomes include preterm birth, low birth weight, pregnancy-induced hypertension, and postpartum depression (Farr & Bish, 2013). A mental health evaluation is a new area of focus for obstetricians, midwives, and women’s health and family nurse practitioners. In May 2015, the American College of Obstetricians and Gynecologists began recommending screening women for depression during pregnancy; depression can be diagnosed by various tools such as the Edinburgh Postnatal Depression Scale (The American College of Obstetricians and
Gynecologists [ACOG], 2015). Preconception counseling and prenatal counseling should include emotional health education and education about the consequences of poor mental health to provide optimal outcomes for both the mother and the fetus. This education could include information on yoga which can provide the pregnant woman with tools to manage her emotional health and reduce symptoms of depression (Field, Diego, Delgado, & Medina, 2013). Through research, treatment of prenatal depression with yoga has shown promising outcomes (Field, Diego, Delgado, & Medina, 2013; Field et al., 2012). Despite these research findings, it may not be a common practice to educate depressed pregnant women on yoga as it is not mentioned in clinical practice guidelines established by ACOG (2009) for treatment of depression in pregnant women.

The purpose of this paper is to review evidence-based research articles to determine if in pregnant women with depression, the practice of yoga versus standard care will decrease feelings of depression during pregnancy. This synthesis paper will provide a summary of the evidence to support the potential benefits of integrating yoga to reduce prenatal depression in depressed pregnant women.

**Literature Search**

A search for original studies was conducted in several databases including CINAHL, PubMed, Cochrane, Ovid, and PsycINFO to identify studies focusing on relaxation techniques to decrease feelings of depression in pregnant women suffering with depression. Terms used for search were “pregnant,” “pregnancy,” “prenatal,” “depression,” “yoga,” or “relaxation techniques.” MeSH terms used were “pregnant woman,” “pregnant women,” “care, prenatal,” “depression,” “yoga,” or “relaxation techniques.” Various combinations of these terms were used to elicit different results. Search limitations included articles published within the last five
years, peer reviewed, original research articles, and English-only text. The initial combination of the terms “depression” and “pregnancy” and “yoga” yielded sixteen results in CINAHL. In all databases, a total of fifty-eight articles were found. Studies were excluded that were interventions other than yoga, review articles, pilot studies, non-full text articles, and duplicate articles. Abstracts were reviewed and selection criteria for the five articles in this literature review included randomized controlled trials (RCTs) with the primary intervention of yoga to manage depression in pregnant women.

The American College of Obstetricians and Gynecologists, a professional website, and the National Guideline Clearinghouse were also reviewed for potential clinical guidelines and resources regarding prenatal depression. Two ACOG recommendation publications on prenatal depression were reviewed.

**Yoga Innovation**

Prenatal education should include relaxation techniques to reduce stress thus aiding in the management of depression, and to increase awareness about the importance of emotional health during pregnancy. In examining non-pharmacologic interventions for depression during pregnancy, research studies suggest that yoga is an effective intervention in reducing feelings of depression among pregnant women who have been diagnosed with depression (Field, Diego, Delgado, & Medina, 2013; Field et al., 2012), and pregnant women without the diagnosis of depression (Davis, Goodman, Leiferman, Taylor, & Dimidjian, 2015; Newham et al., 2014; Satyapriya, Nagarathna, Padmalatha, & Nagendra, 2013). Thus, yoga education is essential in management of depression during pregnancy.

Yoga is the practice of modifications of the mind and body, and through yoga practice, one can manage psychological and physiological misalignments (Satyapriya, Nagarathna,
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Padmalatha, & Nagendra, 2013). Regular practice of yoga leads to a balanced state of mind and body in which one can effectively acclimate to daily stressors and challenges (Satyapriya, Nagarathna, Padmalatha, & Nagendra, 2013). Relaxation technique education, such as education on yoga postures, provides the mother with tools to cope with stressful situations and to focus on healthy lifestyle behaviors to provide for optimal fetal development.

A program of a yoga education can be implemented in a women’s health practice that cares for pregnant women with depression. Yoga practice education can be provided via a handout for pregnant women to inform the women on relaxation techniques, which will include the yoga postures taught in the research study by Field et al. (2012). Stress reduction through yoga practice has been associated with a healthier pregnancy for both the mother and the fetus (Davis, Goodman, Leiferman, Taylor, & Dimidijan, 2015). This innovation is consistent with the organization’s culture because health and well-being during pregnancy are central to both the patients and the providers. This program is in alignment with the organization’s resources because it will only require the printing of a handout for the pregnant women, which is a cost-effective educational tool. In this organization, educational handouts are a main source of patient education to reinforce the teaching completed during the provider visit.

This paper will explore the relaxation technique of yoga in pregnant women suffering with depression as evidenced by a decrease in feelings of depression. Additionally, it proposes an evidence-based yoga intervention as outlined in Appendix A to be utilized in clinics that care for depressed pregnant women.

Synthesis of Literature

Five research studies published between 2012 and 2015 display the efficacy of yoga in pregnant women for the management of depressive symptoms. The management of clinically
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depressed pregnant women with yoga has shown promising outcomes in two RCTs (Field, Diego, Delgado, & Medina, 2013; Field et al., 2012). Similarly, three RCTs convey that yoga is effective in decreasing depressive symptoms among pregnant women (Davis, Goodman, Leiferman, Taylor, & Dimidijian, 2015; Newham et al., 2014; Satyapriya, Nagarathna, Padmalatha, & Nagendra, 2013). Three studies were conducted in the United States, one in the United Kingdom, and one in India. A total of 377 pregnant women were included in the five studies. Sample sizes ranged from forty-six to ninety-six participants. Interventions in all studies included a yoga program with group classes. All five studies included the outcomes of depression and anxiety symptoms.

**Prenatal Depression Management with Yoga**

Two studies conducted by the same group of investigators compared a twelve week yoga intervention versus a control group in clinically depressed pregnant women (Field, Diego, Delgado, & Medina, 2013; Field et al., 2012); the earlier study had an additional intervention group of massage therapy (Field et al., 2012). Overall, both studies showed reductions in depression, anxiety, anger, back pain, and leg pain in the intervention group compared to a social support control group or a standard prenatal care control group; improvements in partner relationships in both the yoga and massage intervention groups were observed in the earlier study. There were significantly better birth outcomes including greater gestational age and greater birth weight in the intervention groups compared to the control group (Field et al., 2012). The sample sizes for both studies were small and an instrument to measure back and leg pain was not described. Nevertheless, both RCTs provide support for the planned intervention and were conducted in pregnant women who were clinically depressed, the target population for the planned evidence-based program. The earlier study (Field et al., 2012) also provides a detailed
description of the yoga intervention that makes it easy and ideal to replicate. Also, outcome scales were completed at baseline and post intervention, making the results linear and easy to interpret.

Prenatal Depressive Symptom Management with Yoga

Three studies focused on pregnant women who reported symptoms of depression or anxiety. An eight or sixteen week yoga program was compared to a control group. In the study by Davis, Goodman, Leiferman, Taylor, & Dimidjian (2015), participants in the eight week yoga intervention group had a significantly decreased negative affect compared to the control group. The yoga intervention was found to be feasible for participants, and had high credibility and satisfaction scores. A strength of this study is that the intervention was evaluated for feasibility, credibility and satisfaction showing that pregnant women could participate in the yoga program and were pleased with the program. A limitation is that the control group was not restricted in terms of resource utilization, such as prenatal yoga, outside of the study.

In the study by Newham et al. (2014), there was a significant decrease in anxiety and cortisol levels in the eight week yoga intervention group over time. Also, there was a significantly greater increase in depression in the control group from baseline to post intervention compared to the intervention group. One strength is that the State-Trait Anxiety Inventory and cortisol evaluations were completed pre and post session on the first and last days of the yoga intervention, which allowed for a correlation of feelings of anxiety and hormone markers of anxiety. A limitation is that the control group participants were allowed to participate in yoga outside of the study, which may have impacted the study results.

In the study by Satyapriya, Nagarathna, Padmalatha, & Nagendra (2013), there was a significantly greater decrease in negative pregnancy related experience, anxiety, and depression
in the sixteen week yoga intervention group over time compared to the control group. A limitation is that the yoga intervention was compared to a control group that taught antenatal stretching exercises, rather than standard prenatal care.

Holistic interventions, such as yoga, have been recognized as effective interventions to manage depression during pregnancy. The findings of this literature review endorse the likely benefits of a yoga program that aids in mitigation of depressive symptoms during pregnancy providing better outcomes as compared to control groups.

**Conclusion**

In summary, it is essential to manage prenatal depression with evidence-based practice programs. Research has demonstrated that yoga practice is safe, effective, feasible, and decreases prenatal depressive symptoms in both depressed pregnant women and pregnant women with symptoms of depression or anxiety. In the Family Nurse Practitioner role, emotional health education, depression screening, and management of depression with yoga practice is key to potentially preventing adverse pregnancy outcomes. Based on a yoga practice protocol shown to be effective in prenatal depression, this paper proposes that clinics that care for depressed pregnant women employ an evidence-based yoga intervention spanning twelve weeks with a minimum of twice weekly yoga practice. Future research should include the diverse demographics of socioeconomic status, prenatal care access, and ethnicity of depressed pregnant women to strengthen the data supporting yoga practice for prenatal depression management.
References


Centers for Disease Control and Prevention. (2013). Mental health among women of reproductive age. Retrieved from CDC:
http://www.cdc.gov/reproductivehealth/depression/pdfs/mental_health_women_repo_age.pdf


Appendix A

Yoga Intervention for Prenatal Depression Protocol*

1. Objective

Depression is a leading cause of global morbidity, and one of the most common medical conditions during pregnancy.\(^1\) Even after a prenatal depression diagnosis, several barriers to treatment exist including cost, patient opposition to treatment, and stigma.\(^1\) Depression during pregnancy can lead to various deleterious outcomes. These outcomes include preterm birth, low birth weight, pregnancy-induced hypertension, and postpartum depression.\(^2\) Through research, treatment of prenatal depression with yoga has shown encouraging outcomes.\(^3,4\) Yoga practice education can be provided via a handout for pregnant women to inform the women on relaxation techniques, which will include the yoga postures taught in a research study which utilized prenatal yoga.\(^4\) This protocol will help with the problem of prenatal depression by improving standard of care practice through implementation of yoga practice for depressed pregnant women.

2. Inclusion/Exclusion Criteria\(^4\)

a. Inclusion Criteria

i. Age > 18 years
ii. Singleton pregnancy
iii. Gestational age ≥ 18 weeks
iv. Uncomplicated pregnancy
v. A diagnosis of depression based on the Structured Clinical Interview for Depression (SCID)

b. Exclusion Criteria

i. Age ≥ 40 years
ii. Multifetal pregnancy
iii. Gestational age > 22 weeks at initial screen
iv. Medical illness (i.e. diabetes mellitus)
v. Other psychiatric condition (i.e. bipolar disorder)
vi. Self-reported drug use or medications that might confound the depression effects

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* Protocol was taken directly and adapted from the above study: Field et al., 2012.
3. Procedure

a. Equipment/Materials

Staff will be trained on the yoga postures during an in-service to be able to educate participants on the yoga postures. Staff will be given the yoga posture handout and the yoga practice log handout. All participants will be provided with yoga education, a yoga posture handout, and a yoga practice home log. The yoga posture handout will describe each posture in detail. Participant yoga practice will take place in her home environment and on her own schedule. Participants will be encouraged to practice yoga at a minimum of twice weekly, each session for twenty minutes. Participants will be asked to keep a log of yoga practice.

Participants will complete the Center for Epidemiological Studies-Depression Scale (CES-D) prior to the first session of yoga and after the last session of the twelve week yoga program. Participants will report the infant’s gestational age and birthweight at the six-week postpartum visit.

b. Duration

Data collection will start with the completion of the CES-D prior to the first session of yoga.

Data collection will continue for twelve weeks via a home yoga practice log. The CES-D will be completed again after the last session of the twelve week yoga program.

Data collection will be completed at the six-week postpartum visit with the self-report of the infant’s gestational age at birth and birth weight.

c. Description

Pregnant women will be screened for depression during a second trimester visit. The SCID will be the screening tool used to determine if the participant is clinically depressed. Participants who agree to enroll in the study will be given the yoga posture handout and the yoga practice log handout. Participants will be educated on the yoga postures and instructed on how to complete the home practice log. Participants will be encouraged to practice yoga at a minimum of twice weekly, each session for twenty minutes. At each prenatal visit, participants will be able to ask any questions about the yoga practice. Data collection will be throughout the twelve week yoga program and end at the six-week postpartum visit. The CES-D will be completed prior to the first session of yoga and after the last session of yoga. Data collection will include days of yoga practice and minutes of yoga practice. Gestational age at birth and birth weight will be reported at the six-week postpartum visit.
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i. Yoga routine

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<thead>
<tr>
<th>Yoga postures</th>
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<tbody>
<tr>
<td>Stretching from sitting on the floor position with legs crossed (straight back)</td>
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<tr>
<td>1) Spinal twist: right arm around to right, right hand on floor, left hand on right knee</td>
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<tr>
<td>2) Repeat on left side</td>
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<table>
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<tr>
<th>On hands &amp; knees (Stretching back)</th>
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<tr>
<td>1) Table-Pose: on hands and knees with back flat</td>
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<td>2) Cat-cow: undulating center of back down with face up (cow) and back up with face down (cat)</td>
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<td>3) Kneeling balance: right arm straight forward, left leg straight back. Bend leg &amp; grab ankle with right hand</td>
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<td>4) Repeat on opposite side</td>
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<tr>
<td>5) Kneeling warrior: kneel on right knee, place left foot extended and perpendicular to right foot, left hand straight up in the air, looking up at left hand</td>
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<td>6) Repeat on opposite side</td>
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<tr>
<td>7) Child’s pose: lying back on haunches, forearms forward on floor, forehead on forearms</td>
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<tr>
<th>Up on knees (Stretching legs)</th>
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<tbody>
<tr>
<td>1) Runner’s stretch: stretching forward with right foot on floor, both hands on right knee</td>
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<td>2) Repeat on left side</td>
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<td>3) Starting up and bending at the waist, hanging down with flat hands on floor</td>
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<th>Standing up (Balancing)</th>
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<tr>
<td>1) Stork-pose: one foot up high of other leg, hands in prayer position</td>
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<td>2) Tree-pose: right foot on left thigh or on left calf, hands raised above head in prayer position</td>
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<td>3) Repeat with left foot</td>
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<tr>
<td>4) Eagle pose: arms intertwined in front of body, wrap one leg around other</td>
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Sunset Salutation
1) Start in standing prayer position
2) Swoop down to floor with prayer hands, bring hands back up and over head, slight back bend, then move hands back down to floor to support self
3) Right foot back on floor and move left foot back on floor (into “down dog” or an inverted V position)
   4) Walk feet towards hands
5) Walk hands up legs into standing position
6) Then slowly up over head with prayer hands
7) Back to standing prayer position
8) Repeat on left side

Warrior Poses
1) Warrior one: facing forward, right leg forward and bent, left leg back and foot pointed to left, both arms raised next to ears
2) Warrior two: moving from warrior one into warrior two, bring right arm forward and left arm back and lean forward, bending right leg
3) Repeat warrior one and two on other side, moving to other side by bending over middle and relaxing with arms hanging down
4) Triangle: both legs straight in a V position, right leg forward, move right hand down leg to ankle, raise left arm above head and look up to left hand
5) Inverted triangle: switch arms with left hand flat on floor next to right foot and right arm above head, looking up to right hand

Seated on floor
1) Sitting angular pose: legs out in V position, walking hands out legs
2) Cow’s head pose: wrap one leg under another, move one arm up and down back, and other hand back around and up back, clasp hands
3) Butterflies: seated in cross-legged position, move knees up and down with hands

Prayer position
1) Sit with legs crossed with arms extended in prayer position above head, bring prayer hands down
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<tr>
<th>Reference</th>
<th>Purpose/Design</th>
<th>Sample/Setting</th>
<th>Intervention/Outcomes</th>
<th>Results</th>
<th>Discussion/Limitations</th>
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<tbody>
<tr>
<td>Davis, K., Goodman, S. H., Leiferman, J., Taylor, M., &amp; Dimidjian, S. (2015). A randomized controlled trial of yoga for pregnant women with symptoms of depression and anxiety. Complementary Therapies in Clinical Practice, 21, 166-172.</td>
<td>A randomized controlled trial in which pregnant women were assigned to an eight week yoga intervention plus treatment as usual (TAU) or TAU only in order to examine the preliminary outcomes of depression, negative affect, and anxiety. Additionally, to examine the feasibility, credibility and satisfaction of the intervention.</td>
<td>N=46 pregnant women. 18-45 years old. &lt;= 28 weeks gestation. Participants with elevated depression or anxiety symptoms. Participants were recruited in Boulder and Denver, Colorado through healthcare provider referral and community advertisement. University of Colorado, Boulder.</td>
<td>Intervention: N=23. An eight week yoga program consisting of 75 minute (min) weekly, group classes. Classes offered one day each week. A prenatal yoga instructor taught the group classes based on the traditional Asthanga Vinyasa yoga modified for pregnancy. Class: breathing practice (5 min), synchronizing breath, gaze, movement (10 min), standing postures (20 min), seated postures (20 min), cool down (20 min). Participants received a yoga instructional video for home practice, no set schedule for home practice was encouraged.</td>
<td>Result 1: Both the intervention and TAU groups had a decrease in depression scores on the EPDS. No significance in decrease between the two groups. Result 2: Intervention group had a significantly greater reduction in negative affect than control group (p=0.011) on the PANAS-N. Result 3: Both the intervention and TAU groups had a decrease in anxiety scores on the STAI. No significance in decrease between the two groups. Result 4: There was high class attendance, participants attended 6/8 yoga classes. Result 5: There were high credibility scores of the yoga intervention, mean score: 40.95. Result 6: There were high satisfaction scores of the yoga intervention, mean score: 28.15.</td>
<td>Discussion: There was a decrease in depression and anxiety in the intervention group, but was not significantly different from the decrease in depression and anxiety in the control group. Participants in the intervention group had a significantly decreased negative affect compared to the control group. The yoga intervention was found to be feasible for participants, and had high credibility and satisfaction scores. Results suggest that yoga is a beneficial intervention for depression and anxiety symptoms during pregnancy, but may not be superior compared to other interventions. Strengths: Randomized controlled trial. All participants had symptoms of depression or anxiety. The intervention was evaluated for feasibility, credibility and satisfaction. Limitations: The study was completed in a physically active cohort of pregnant women. The control group was not restricted in terms of resource utilization outside of the study. The sample size of 46 participants was small.</td>
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<td>Field, T., Diego, M., Delgado, J., &amp; Medina, L. (2013). Yoga and social support reduce prenatal depression, anxiety and cortisol. <em>Journal of Bodywork &amp; Movement Therapies, 17</em>, 397-403.</td>
<td>A randomized controlled trial in which pregnant women were assigned to a twelve week yoga intervention or a social support control group in order to examine the outcomes of prenatal and postpartum depression.</td>
<td>N=92 depressed pregnant women measured at baseline by the Structured Clinical Interview Depression (SCID) Scale. 20-38 years old. 22 weeks gestation. Recruited from two prenatal ultrasound clinics. University of Miami Medical School.</td>
<td>Intervention: N=46. A twelve week yoga program consisting of 20 min weekly, group classes. A prenatal yoga instructor taught the group classes. Class: sitting, kneeling and standing yoga poses. Control: N=46. A twelve week leaderless, social support group consisting of 20 min, weekly meetings. Outcomes: 1. Depression measured by the Center for Epidemiological Studies Depression Scale (CES-D), the EDPS, the Profile of Mood States (POMS). 2. Anxiety measured by the STAI. 3. Anger measured by the State Anger Inventory (STAXI). 4. Partner relationships measured by the Relationship Questionnaire. All measurements taken at baseline and end of intervention. 5. Back pain and leg pain (scale not mentioned). POMS, STAI, STAXI, back and leg pain measured post-first day and pre-last day of intervention. CES-D, POMS and STAI measured at 1-3 weeks postpartum. 6. Cortisol, estriol, and progesterone measured from saliva samples. Measurements taken before and after the first and last sessions.</td>
<td>Result 1: Intervention group had significant decrease in depression scores on the first and last days of intervention (p=0.01, p=0.001 respectively) on POMS compared to control group. Both intervention and control group showed decreased depression on the CES-D, EPDS, and POMS from baseline to post intervention, no significance in decrease between the two groups. Both intervention and control group showed decreased depression on the CES-D and POMS from baseline to the postpartum visit, no significance in decrease between the two groups. Result 2: Intervention group had significant decrease in anxiety scores on the first and last days of intervention (p=0.001) on STAI compared to control group. Both intervention and control group showed decreased anxiety on the STAI from baseline to post intervention, no significance in decrease between the two groups. Result 3: Intervention group had significant decrease in anger scores on the first day of intervention (p=0.005) on STAXI compared to control group. Both intervention and control group showed decreased anger on the STAXI from baseline to post intervention, no significance in decrease between the two groups. Result 4: Both intervention and control group showed improved relationship on the Relationship Questionnaire from baseline to post intervention, no significance in decrease between the two groups. Result 5: Intervention group had significant decrease in back pain on the first and last days of intervention (p=0.001) compared to control group. Intervention group had significant decrease in leg pain on the first day of intervention (p=0.001) compared to control group. Result 6: Both intervention and control groups showed reduced cortisol, estriol, and progesterone from pre to post session on the last day. Both groups showed increased levels from the first to the last day of the intervention. No significance in change between two groups. Discussion: Participants in the yoga group had a significant decrease in depression, anxiety, anger, back pain, and leg pain when pre to post session scales were evaluated compared to the social support control group. Results suggest that yoga may be an effective intervention in reducing depression and anxiety, especially as seen pre and post yoga practice. Strengths: Randomized controlled trial. All participants were clinically depressed. Measurements were taken pre and post session, baseline and post intervention, and at the postpartum visit to allow for a comparison at various time intervals. Limitations: The control group was a social support group which may have provided the participants with additional support resources above standard of care. Results were difficult to interpret because the same scales were not used at each interval of the study. There was no scale described for back pain and leg pain. The sample size of 92 participants was small.</td>
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<td>Field, T., Diego, M., Hernandez-Reif, M., Medina, L., Delgado, J., &amp; Hernandez, A. (2012). Yoga and massage therapy reduce prenatal depression and prematurity. <em>Journal of Bodywork &amp; Movement Therapies</em>, 16, 204-209.</td>
<td>A randomized controlled trial in which pregnant women were assigned to a twelve week yoga intervention or massage therapy intervention or standard prenatal care control group in order to examine stress measures, pain measures, and neonatal outcome measures.</td>
<td>N= 84 depressed pregnant women measured at baseline by the SCID. 18-40 years old. 18-22 weeks gestation. Recruited from two prenatal ultrasound clinics. University of Miami Medical School.</td>
<td>Intervention: N= (number not included) A twelve week yoga program consisting of 20 min twice weekly, group classes. A prenatal yoga instructor taught the group classes. Class: sitting, kneeling and standing yoga poses. Intervention: N= (number not included) A twelve week massage therapy program consisting of 20 min full body massage. A licensed massage therapist performed the massages. Massage: head and neck, back, arms, legs. Control: N= (number not included) Standard prenatal care. Outcomes: 1. Depression measured by the CES-D 2. Anxiety measured by the STAI. 3. Anger measured by the STAXI. 4. Partner relationships measured by the Relationship Questionnaire. 5. Back pain and leg pain (scale not mentioned). Measurements taken at the first and last days of the session. 6. Birth outcomes measures included gestational age at delivery and birth weight.</td>
<td>Result 1: Intervention groups (yoga and massage) had significant decrease in depression scores post intervention (p&lt;0.001) on CES-D compared to control group. Result 2: Intervention groups had significant decrease in anxiety scores post intervention (p&lt;0.001) on STAI compared to control group. Result 3: Intervention groups had significant decrease in anger scores post intervention (p&lt;0.001) on STAXI compared to control group. Result 4: Intervention groups had significant increase in relationship scores post intervention (p&lt;0.001) on the Relationship Questionnaire compared to control group. Result 5: Intervention groups had significant decrease in back pain and leg pain scores post intervention (p&lt;0.001) compared to control group. Result 6: Intervention groups had significantly better birth outcomes: greater gestational age (p&lt;0.005) and greater birthweight (p&lt;0.001) compared to control group.</td>
<td>Discussion: There was significantly greater decrease in depression, anxiety, anger, back pain, leg pain, and an increase in partner relationships in both the yoga and massage intervention groups compared to the control group. There were significantly better birth outcomes including greater gestational age and greater birth weight in the intervention groups compared to the control group. Results suggest that yoga and massage therapy may be effective alternatives for the treatment of depression during pregnancy. Strengths: Randomized controlled trial. All participants were clinically depressed. A detailed description of the yoga intervention and the massage intervention are included in an appendix to the article, so it would be an ideal study to replicate. Scales were completed at baseline and post-intervention, making the results linear and easy to interpret. Limitations: The study did not indicate how many participants were assigned to each of the intervention groups or the control group. There was no scale described for back pain and leg pain. The sample size of 84 participants was small.</td>
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<td>Newham, J., Wittkowski, A., Hurley, J., Aplin, J. D., &amp; Westwood, M. (2014). Effects of antenatal yoga on maternal anxiety and depression: A randomized controlled trial. <em>Depression and Anxiety, 31,</em> 631-640.</td>
<td>A randomized controlled trial in which pregnant women were assigned to an eight week yoga intervention or TAU control group in order to examine anxiety and depression.</td>
<td>N= 59 pregnant women (four reported previous depression and none reported previous anxiety). &gt;18 years old. Late second to third trimester. Recruited by sonographers at the twenty-week ultrasound or by midwives at the twenty-four week routine prenatal appointment. University of Manchester, United Kingdom.</td>
<td>Intervention: N= 31. An eight week yoga program consisting of 1.5 hour weekly, group classes. A prenatal yoga instructor taught the group classes based on Hatha yoga. Class: exercises, postures, relaxation/breathing techniques. Control: N= 28. TAU. Participants in the control group were allowed to attend yoga classes outside of the study. Outcomes: 1. Anxiety measured by STAI and Wijma Delivery Expectancy Questionnaire (WDEQ). 2. Depression measured by EPDS. All measurements taken at baseline and post-intervention. The intervention group additionally completed the STAI pre and post session at the first and last yoga session. 3. Cortisol measured via a saliva sample. The intervention group completed hormone assessment pre and post session at the first and last yoga session.</td>
<td>Result 1: Intervention group had significant decrease in anxiety scores on the first and last days of intervention (p&lt;0.001) on STAI compared to baseline measurements. No significant differences were observed on STAI between baseline and follow-up between the intervention or control group. Intervention group had significant decrease in anxiety scores from baseline to post intervention (p&lt;0.05) on WDEQ compared to control group. Result 2: Control group had significantly greater increase in depression (p=0.04) on EPDS compared to intervention group. Result 3: Intervention group had significant decrease in cortisol levels on the first and last days of intervention (p&lt;0.001) based on a saliva sample compared to baseline measurements.</td>
<td>Discussion: There was a significant decrease in anxiety and cortisol levels in intervention group when pre to post session scales were evaluated. Also, there was a significantly greater decrease in anxiety in intervention group from baseline to post intervention compared to the control group. There was a significantly greater increase in depression in the control group from baseline to post intervention compared to the intervention group. Results suggest that yoga may be effective in anxiety reduction and preventing an increase in depressive symptoms. Strengths: Randomized controlled trial. The yoga intervention was 1.5 hours weekly, thus providing the intervention group with a large amount of time in yoga practice. STAI and cortisol evaluations were completed pre and post session on the first and last days of the yoga intervention, which allowed correlation of feelings of anxiety and hormone markers of anxiety. Limitations: Only four of the participants reported previous depression and none of the participants reported previous anxiety. The control group participants were allowed to participate in yoga outside of the study, which may have altered the study results. The sample size of 59 participants was small.</td>
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<td>Reference</td>
<td>Purpose/Design</td>
<td>Sample/Setting</td>
<td>Intervention/Outcomes</td>
<td>Results</td>
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<td>Satyapriya, M., Nagarathna, R., Padmalatha, V., &amp; Nagendra, H. (2013). Effect of integrated yoga on anxiety, depression and well being in normal pregnancy. <em>Complementary Therapies in Clinical Practice</em>, 19, 230-236.</td>
<td>A randomized controlled trial in which pregnant women were assigned to a sixteen week yoga intervention or an antenatal exercise control group in order to examine pregnancy experience, anxiety and depression.</td>
<td>N= 96 pregnant women, “normal pregnancy.” 20-35 years old. 18-20 weeks gestation. Recruited from a pool of 200 women who had registered for antenatal care at Maiya multispeciality hospital in south Bengaluru, India.</td>
<td>Intervention: N= 51. A sixteen week yoga program consisting of one hour daily group classes for 4 weeks, then next twelve weeks at home. The yoga program used was called the Integrated Approach of Yoga Therapy. Class: lectures, breathing exercises, meditation, relaxation, postures: standing, sitting, supine. Control: N= 45. A sixteen week antenatal exercise program consisting of one hour daily group classes for 4 weeks, then next twelve weeks at home. Class: lectures, stretching exercises. Outcomes: 1. Pregnancy related experience, including stressors and concerns, measured by Pregnancy Experience Questionnaire (PEQ). 2. Anxiety measured by STAI. 3. Depression measured by Hospital Anxiety Depression Scale (HADS). Measurements taken baseline and post intervention.</td>
<td>Result 1: Intervention group had significant decrease in negative pregnancy related experience scores from baseline to post intervention (p&lt;0.001) on PEQ compared to control group. Result 2: Intervention group had significant decrease in anxiety scores from baseline to post intervention (p&lt;0.001) on STAI compared to control group. Result 3: Intervention group had significant decrease in depression scores from baseline to post intervention (p&lt;0.001) on HADS compared to control group.</td>
<td>Discussion: There was a significantly greater decrease in negative pregnancy related experience, anxiety and depression in intervention group when baseline and post intervention scales were evaluated as compared to the control group. Results suggest that yoga may be effective in reducing negative pregnancy related experiences, anxiety and depressive symptoms in pregnant women. Strengths: Randomized controlled trial. A detailed description of the yoga intervention and antenatal exercise program is included in the article. Limitations: Participants were not clinically depressed, participants were categorized as “normal” pregnant women. The yoga intervention was compared to a control group that was taught antenatal stretching exercises, rather than treatment as usual. The sample size of 96 participants was small.</td>
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