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**Does Yoga Decrease Self-report of Antenatal Depression Among Healthy Pregnant Women
Aged 18-40 Years Old in the 2nd and 3rd Trimesters?**

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A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

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In

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ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not yoga decreases self-report of antenatal depression among healthy pregnant women aged 18-40 years old in the 2nd and 3rd trimesters.

Study Design: Review of three randomized controlled trials (RCTs) published in peer reviewed journals in 2013 and one RCT published in a peer reviewed journal in 2012 were used.

Data Source: Data sources included articles published in English in peer reviewed journals found using PubMed. Articles were selected based on their relevance to my clinical question.

Outcomes Measured: All four studies measured self-report of symptoms of depression using a variety of self-report questionnaires including the Hospital Anxiety Depression Scale (HADS), Center for Epidemiological Studies Depression Scale (CES-D), Edinburgh Postnatal Depression Scale (EPDS) and the Profile of Mood States (POMS).

Results: Three studies found that self-reported symptoms of depression decreased with yoga therapy as compared to control groups of regular prenatal care and standard antenatal practices including simple stretching exercises. One study found that self-reported symptoms of depression decreased with both yoga therapy and the control group, a social support group.

Conclusions: These four RCTs found that there is a statistically significant decrease in self-reports of antenatal depression among healthy pregnant women aged 18-40 years old in the 2nd and 3rd trimesters who engaged in yoga therapy as compared to control groups. However, the generalizability of these results needs further investigation.

Key Words: yoga, depression

INTRODUCTION

Depression consists of a constellation of symptoms including mood, physical complaints, and cognitive symptoms that frequently include “a loss of interest and pleasure (anhedonia), withdrawal from activities, and feelings of guilt. Also included are inability to concentrate, some cognitive dysfunction, anxiety, chronic fatigue, feelings of worthlessness, somatic complaints (unexplained somatic complaints frequently indicate depression), loss of sexual drive, and thoughts of death”.¹ This paper evaluates four randomized controlled trials that investigate the ability of yoga to decrease self-reports of antenatal depression among healthy pregnant women in their 2nd and 3rd trimesters.

According to the American College of Obstetricians and Gynecologists, 14-23% of pregnant women will experience depressive symptoms while pregnant.² In 2000, the costs of depression in the United States totaled \$83.1 billion dollars including direct medical costs, suicide-related mortality costs, and workplace costs.³ Specific health care costs for maternal depression are unknown; however pregnant women with untreated depression are at greater risk for premature births which in 2005 cost a total of \$26.2 billion including delivery costs, early intervention and special education services, and lost household and labor market productivity.³ The average number of health care visits each year for antenatal depression is unknown but according to the Center for Disease Control, from 2009-2010 there were 8 million ambulatory care visits for depression in the general population, and in 2010, there were 395,000 discharges from inpatient hospital care due to depression.⁴

The exact cause of prenatal depression is unknown but evidence suggests that women may have an underlying vulnerability to changing hormone levels that interact with genetics, psychosocial factors and life stressors.³ Several risk factors for maternal depression have been

identified and include a history of mood disorders, substance abuse, previous maternal depression, low socioeconomic status, poor social support, and an unplanned pregnancy.³ The treatment of depression during pregnancy is a very individualized process but generally includes psychotherapy and pharmacotherapy, specifically selective serotonin reuptake inhibitors (SSRIs), but with great caution because of the possible detrimental effects some antidepressants have on fetuses.³ Specifically, the SSRI sertraline (Zoloft) has been found to be first-line treatment for depression in pregnancy, with citalopram (Celexa) being an alternative option.⁵ Some of the potential risks of antidepressant medications on fetuses include teratogenicity, miscarriage, spontaneous preterm birth, low birth weight, and postnatal effects.⁵

Because of the limitations and dangers of pharmacotherapy in pregnancy, other treatment modalities to decrease depressive symptoms during pregnancy are important to explore. Yoga is a mind-body practice that includes the 3 main components of postures/poses (asanas), breath control/regulation (pranayama), and meditation/relaxation (samyana).⁶ Yoga has been shown to have numerous positive effects on health including improving overall fitness, decreasing stress and anxiety, assisting with smoking cessation, pain control, and decreasing blood pressure and cholesterol.⁶

OBJECTIVE

The objective of this selective EBM review is to determine whether or not yoga decreases self-report of antenatal depression among healthy pregnant women aged 18-40 years old in the 2nd and 3rd trimesters.

METHODS

This selective EBM review focused on pregnant women aged 18-40 years old with depression in their 2nd and 3rd trimester. Women participating in yoga as a therapeutic

intervention were compared to women in control groups of social support groups, stretching exercises, and standard prenatal care. Although many outcomes were studied, self-reports of depression was the main focus of this selective review. All four RCTs included in this review were published in English peer reviewed journals after 1996 and were found using keywords “yoga” and “depression” in the database PubMed. Articles were researched and selected by this author based on their relevance to the clinical question and their inclusion of patient oriented evidence that matter (POEMs). Inclusion criteria included studies that were RCTs with pregnant women aged 18-40 years old with singleton, uncomplicated pregnancies and who were diagnosed with depression. In addition, yoga as a therapeutic intervention was an inclusion criteria. Exclusion criteria included studies that were not were RCTs, pregnant women older than 40 years and younger than 18 years, pregnant women with complicated and/or multiple pregnancies, pregnant women with comorbid medical conditions, pregnant women with self-reported drug and alcohol use, and studies that did not include yoga as a therapeutic intervention. Detailed demographics and characteristics of the included RCTs are available in Table 1. Statistical analysis was reported using values including chi square, p values, independent t test, and analysis of variance (ANOVA).

Table 1: Demographics & Characteristics of Included Studies

Study	Type	# Pts	Age (yrs)	Inclusion Criteria	Exclusion Criteria	W/D	Interventions
Satyapriya ¹ (2013)	Prospective RCT	96	20-35	-gestational age 18-20 weeks -prime gravidae -multi gravida with at least 1 live child	-comorbid medical conditions -multiple pregnancy -IVF pregnancy -maternal or fetal abnormality -previous exposure to yoga	8	Integrated approach of yoga therapy (IAYT) session 2 hours/day 3 times a week for 1 month. Continued the practices at home for one hour/day
Field ² (2013)	RCT	92	20-38	-depression -pregnant with one child	-other psychiatric conditions -comorbid medical conditions -illicit drug use -age > 40 and < 20	13	Yoga sessions led by a trained yoga instructor in 20 minute sessions once per week for 12 weeks.
Field ³ (2013)	RCT	84	26.6 (average)	-age >18 -singleton pregnancy -depression -healthy pregnancy	-comorbid medical or psychiatric conditions -illicit drug use or med use -age > 40	0	Yoga sessions led by a trained yoga instructor in 20 minute sessions.
Field ⁴ (2013)	RCT	92	18-37	-depression -singleton pregnancy -healthy pregnancy -age < 40 -no drug use	-comorbid medical conditions -illicit drug use or med use -age > 40 -multiple pregnancy	17	Combined Tai chi and yoga sessions led by a trained yoga instructor in 15 minute sessions once a week x 12 weeks

OUTCOMES MEASURED

Although many outcomes were studied, self-report of depression was the main focus of this selective review. Various self-report questionnaires for depressive symptoms were used including the Hospital Anxiety Depression Scale (HADS),⁷ Center for Epidemiological Studies Depression Scale (CES-D),^{8,9,10} Edinburgh Postnatal Depression Scale (EPDS),⁸ and the Profile of Mood States (POMS).⁸

RESULTS

Four RCT studies compared the efficacy of yoga in reducing self-reports of depression. One study used all three components of yoga therapy (meditations, physical postures, and breathing techniques) and compared it with a control group of simple stretching exercises. Two studies used only the physical postures aspect of yoga therapy and compared it with a control group of social support and standard antenatal care. One study used a combination of tai chi and the physical postures aspect of yoga therapy and compared it with a waitlist control group. Trained yoga instructors were used in all four RCTs and the yoga exercises used were routines specifically modified for the safety of pregnant women in their 2nd and 3rd trimesters. Participants in three RCTs were recruited from a prenatal ultrasound clinic affiliated with a large university medical center and participants in one RCT were recruited from antenatal care at a multispecialty hospital. All four RCTs included women participants who were between 18 and 40 years old and who were healthy with a singleton pregnancy and who met diagnostic criteria for depression. Three of the four studies used the Structured Clinical Inventory for DSM IV Diagnosis (SCID) to determine if participants met the criteria for depression; one study did not explain how their participants met the criteria for depression. All four RCTs excluded women participants who self-reported using illicit drugs, had co-morbid medical conditions and who were pregnant with

more than one fetus. Three studies excluded women with other psychiatric illnesses other than depression and only one study excluded women with previous exposure to yoga. In all four RCTs, participants were not analyzed in the groups they were randomized using intention-to-treat analysis. In addition, because outcomes were not presented as dichotomous data, relative benefit increase (RBI), absolute benefit increase (ABI), and number needed to treat (NNT) were not analyzed.

In the study by Satyapriya et al., 105 participants were randomly assigned to either the experimental group of yoga therapy or the control group of simple stretching exercises. Although the study participants could not be blind to the treatment because of the nature of the intervention, some of the study workers were kept blind, specifically the statistician as well as the workers involved in administering the depression assessments. Nine participants dropped out of the study due to moving out of the city and to asking to be in the yoga group “due to popularity of yoga through the media”.⁷ Statistical analysis was done using chi squared test and independent t test to measure the differences between the yoga and control group (see Table 2). The study found that yoga reduced the scores on the HADS depression scale from 6.39 ± 2.55 at 20 weeks gestation to 4.43 ± 1.39 at 36 weeks gestation, which resulted in a statistically significant 30.67% reduction in self-report of depression in the yoga group compared to the control group ($p < 0.001$). The study found no adverse effects of yoga and the study results indicate that yoga is more effective than simple stretching exercises in decreasing self-reports of depression.⁷

Table 2: Independent T-test (with SD) results of the HADS depression scale after intervention.

Group	20 th week	36 th week	% Difference	Sig-P values
Yoga	6.39 ± 2.55	4.43 ± 1.39	30.67 decrease	0.001
Control	6.73 ± 2.22	6.98 ± 2.91	3.57 increase	0.592

In the study by Field et al., 92 participants were randomly assigned to either the experimental group of yoga therapy or the control group of social support groups. Although the study participants could not be blind to the treatment because of the nature of the intervention, the researchers were blinded to the group assignments and to the hypothesis of the study. Thirteen participants dropped out of the study due to moving out of the city and employment obstacles. Statistical analysis was performed using repeated measures by group ANOVAs to measure the differences between the yoga and control group (see Table 3). The study found that both groups showed a statistically significant decrease in self-reports of depression on the CES-D, EPDS, and POMS from the first day and the last day of the intervention. Mean scores for the long term effects of yoga on the first and last day of the intervention using the CES-D, EPDS, and POMS were found to be 33.0(10.2) to 23.8(9.3) ($p=0.01$), 12.5(5.0) to 8.5(5.3) ($p=0.005$), and 26.7(13.9) to 18.8(13.2) ($p=0.001$), respectively. The study found that both yoga and social support groups decreased self-reports of depression but with no statistically significant difference between the two groups.⁸

Table 3: Mean scores (with SD) for long term effects of yoga versus control group.

	Yoga		P value	Control		P value
	1 st day	Last day		1 st day	Last day	
CES-D	33.0 (10.2)	23.8 (9.3)	0.01	35.1 (9.8)	25.2 (10.4)	0.001

EPDS	12.5 (5.0)	8.5 (5.3)	0.005	16.4 (4.5)	11.5 (6.5)	0.005
POMS	26.7 (13.9)	18.8 (13.2)	0.001	27.3 (14.0)	22.1 (16.5)	0.001

In another study by Field et al., 84 participants were randomly assigned to either the experimental group of yoga therapy or the control group of standard prenatal care. Although the study participants could not be blind to the treatment because of the nature of the intervention, the researchers were blinded to the group assignments and to the hypothesis of the study. There were no participants reported as lost to follow up. Statistical analysis was performed using repeated measures by group ANOVAs to measure the differences between the yoga and control group (see Table 4). The study found a statistically significant decrease in self-reports of depression on the CES-D for the yoga group ($F=82.40, p<.001$) as compared to the control group.⁹

Table 4: Mean scores (with SD) for self-reports of depression on the CES-D.

Group	1 st day	Last day	Sig-P values
Yoga	28.35 (8.86)	20.12 (10.51)	$p < 0.001$
Control	22.65 (6.99)	19.27 (10.12)	$p < 0.001$

Lastly, in the third study conducted by Field et al., 92 participants were randomly assigned to either the experimental group of a combined tai chi and yoga group or a waitlist control group. Although the study participants could not be blind to the treatment because of the nature of the intervention, the researchers were blinded to the group assignments and to the hypothesis of the study. There were 17 participants who dropped out of the study due to moving out of the city and due to employment obstacles. Statistical analysis was performed using

repeated measures by group ANOVAs to measure the differences between the tai chi/yoga and control group (see table 5). Mean scores on the CES-D on the first and last day of the intervention for the tai chi/yoga group were found to be 32.4(10.2) to 23.5(9.0) ($p=0.001$). The study found a statistically significant decrease in self-reports of depression for the tai chi/yoga group as compared to the control group.¹⁰

Table 5: Mean scores (with SD) for self-reports of depression on the CES-D.

Group	1 st day	Last day	Sig-P values
Yoga	32.4 (10.2)	23.5 (9.0)	0.001
Control	26.7 (11.2)	23.9 (11.4)	0.001

DISCUSSION

This systematic review suggests that yoga can be used to effectively reduce self-reports of depression in healthy pregnant women aged 18-40 years old in their 2nd and 3rd trimesters. All four RCTs showed statistically significant decreases in depression in participants who received yoga therapy; however several limitations of these studies raise questions about the validity and generalizability of these results.

Several limitations in all four RCTs question the validity of the results. All the studies used self-report questionnaires to measure reduction of depressive symptoms which can lead to bias in participants' responses. In addition, because of the nature of the intervention, participants were not blinded to their treatment status. Only 2 of the 4 RCTs excluded participants taking prescribed medications and only 1 RCT excluded participants who had previous exposure to yoga, both of which could be confounding factors to explain these results. Only one study assessed the compliance of the participants in the yoga group and none of the studies excluded

participants who were engaging in other forms of exercise outside the study. In addition, none of the studies had post-intervention follow up to determine if yoga could effectively reduce symptoms of depression long-term. Specifically, in the study by Field et al., the intervention group consisted of a combination of tai chi and yoga which made it difficult to attribute the results of decreased self-reports of depression to either intervention alone. In the study by Satyapriya et al., the authors did not explain what criteria they used to diagnose their participants as depressed, which questions the validity of the study findings. Lastly, the generalizability of these results is limited to healthy, young, pregnant women with a singleton pregnancy.

While yoga may be an effective alternative for the treatment of depression during pregnancy, there are some limitations to its accessibility. Yoga is not usually covered by health insurance companies; however some health insurance companies provide assistance with gym memberships and some gyms have yoga classes. In addition, there are many different styles of yoga with different focuses like Bikram, Vinyasa, and Hatha.⁶ Not all of these different practices are safe for pregnant women and, like other types of exercise, come with some risk for injuries.

CONCLUSION

The RCTs included in this systematic review indicate that yoga does decrease self-report of antenatal depression among healthy pregnant women aged 18-40 years old in the 2nd and 3rd trimesters. Although the included studies have several limitations to their validity and generalizability, the practice of yoga may be a promising alternative to psychotropic medications to treat depression during pregnancy. Future study is needed before routinely recommending yoga as an effective and safe treatment for depression during pregnancy. Future studies should more closely control the experimental group and include a drug and alcohol screen, exclusion of participants who engage in other forms of exercise, and exclusion of participants engaging in

other forms of psychiatric treatment. Because the practice of yoga has many different variations and components (postures/poses, breath control/regulation, and meditation/relaxation), further research would also benefit from investigating each individual component of yoga separately to determine if there is any benefit of one aspect of yoga over the other.

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