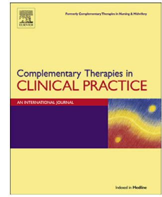
Complementary Therapies in Clinical Practice 21 (2015) 166–172

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp



A randomized controlled trial of yoga for pregnant women with symptoms of depression and anxiety

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ARTICLE INFO

Article history:
Received 22 April 2015
Received in revised form
5 June 2015
Accepted 5 June 2015

Keywords:
Yoga
Pregnancy
Depression
Anxiety
Randomized clinical trial

ABSTRACT

Background: Yoga may be well suited for depressed and anxious pregnant women, given reported benefits of meditation and physical activity and pregnant women's preference for nonpharmacological treatments.
Methods: We randomly assigned 46 pregnant women with symptoms of depression and anxiety to an 8-week yoga intervention or treatment-as-usual (TAU) in order to examine feasibility and preliminary outcomes.
Results: Yoga was associated with high levels of credibility and satisfaction as an intervention for depression and anxiety during pregnancy. Participants in both conditions reported significant improvement in symptoms of depression and anxiety over time; and yoga was associated with significantly greater reduction in negative affect as compared to TAU ($\beta = -0.53$, $SE = 0.20$, $p = .011$).
Conclusion: Prenatal yoga was found to be a feasible and acceptable intervention and was associated with reductions in symptoms of anxiety and depression; however, prenatal yoga only significantly outperformed TAU on reduction of negative affect.

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1. Introduction

Depression and anxiety during pregnancy represent major public health problems. A growing body of research has documented increased risk of adverse correlates and consequences of anxiety and depression for pregnant women and their offspring. Compared with nondepressed pregnant women, depressed pregnant women experience increased risk of postpartum depression, marital dissatisfaction, poor social support, and later problems with parenting stress [27,30,39]. Evidence also suggests increased risk of adverse affective, cognitive, interpersonal and neural correlates for offspring and persistence of such problems well beyond infancy [26].

Antenatal anxiety often co-occurs with depression during pregnancy and co-occurring anxiety has been found to have negative implications for both mother and child, independent of the mother's other psychological symptoms [2]. Negative implications of antenatal anxiety include: postnatal complications [22], preeclampsia [28], preterm labor [8,14], preterm birth [15,38], lower birth weight [8,20], lower APGAR scores [7], behavioral/emotional problems at four years [36], symptoms of ADHD, externalizing problems, and anxiety at nine years [46].

1.1. Yoga as an intervention for antenatal depression and anxiety

Given this context, treatment efforts during pregnancy that target both depression and anxiety hold obvious appeal. Nonpharmacological interventions may offer benefit as many pregnant women report preference for such options [25,43]. Complementary and integrative practices, such as yoga, are gaining acceptance as viable treatment options for a range of physical and mental health problems [5,6,13,34,45,48]. A systematic review of 12 randomized controlled trials of yoga as an intervention for depression among a general population of adults found yoga to be

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http://dx.doi.org/10.1016/j.ctcp.2015.06.005
1744-3881/Published by Elsevier Ltd.

an effective intervention in the short-term treatment of depression [11].

Among pregnant women with subclinical symptom levels of depression or anxiety, yoga has been found to decrease symptoms of anxiety in two randomized controlled trials and to decrease symptoms of depression in one trial [35,41]. Similar results have been reported among women with elevated symptom levels of depression. According to a review of randomized controlled trials conducted by Gong and colleagues [24]; three studies demonstrated evidence for yoga to be a promising intervention for the reduction of depressive symptoms [18,19,21,31]. Another small open trial of yoga ($n = 18$) also found that yoga was associated with significant improvement in symptoms of depression [33].

The present study was designed to examine the feasibility and preliminary outcomes of a yoga intervention among pregnant women with symptoms of depression and anxiety. Using a randomized controlled design comparing an 8-week yoga intervention plus TAU to TAU only, we examined the primary hypotheses that yoga would be feasible to provide for depressed and anxious pregnant women and that it would be associated with significantly decreased symptoms of depression, anxiety, and negative affect as compared to TAU. We predicted pregnant women assigned to the yoga condition would complete the yoga intervention, engage in assigned home practices, and find the intervention to be credible and satisfying. We also evaluated safety with regard to adverse events (i.e. spontaneous abortion or premature delivery), predicting rates would be equal or lower than national prevalence rates.

2. Materials and methods

2.1. Participants

Participants were 46 pregnant women with elevated depression or anxiety symptoms. The University of Colorado Institutional Review Board (IRB) approved the protocol. All participants provided written informed consent prior to enrollment in the study. Inclusion criteria were: (1) pregnant up to 28 weeks gestation, (2) 18–45 years of age, (3) a score $\geq$ 9 on the Edinburgh Postnatal Depression Scale (EPDS), score $\geq$ 25 on the state subscale of the State-Trait Anxiety Inventory (STAI), and/or $\geq$ 35 on the trait subscale of the STAI, (4) engaging in $\leq$60 min of contemplative physical activity, such as yoga or martial arts, per week (5) English speaking, and (6) available for weekly yoga classes. Exclusion criteria were: (1) lifetime diagnosis of schizophrenia or schizoaffective disorder, bipolar disorder, current psychosis, organic mental disorder or pervasive developmental delay, or any other axis I or II disorders that necessitated priority treatment not provided by the study protocol, (2) imminent suicide or homicide risk based on clinical interview, (3) medically high risk pregnancy indicated by presence of chronic or acute medical conditions, as determined by patient's obstetric provider restricting participation due to medical complications. Participants in both groups received \$10 at the completion of the baseline assessment and \$20 after completion of the post-intervention assessment. At the conclusion of the study, participants assigned to the TAU only group were given a free antenatal yoga instructional video and a pass for a free yoga class.

2.2. Recruitment

Participants were recruited in two separate cohorts between July and October of 2011 and January and March of 2012 in the greater Boulder and Denver, Colorado areas through health care provider (HCP) referral and community advertisement. Interested participants who passed an initial online screening were scheduled for an on-site clinical evaluation to provide informed consent and to confirm study eligibility, including communication with the obstetric health care provider.

2.3. Design

Once eligibility requirements were met, participants were randomly assigned to the yoga or TAU condition based on a computer-generated list provided by an independent statistical consultant. Participants in both conditions completed a clinical interview and baseline self-report questionnaires prior to randomization. Assessments of symptoms of depression and anxiety, negative affect, and participation in activities related to treatment as usual were administered in an online format weekly during the intervention and a final assessment was completed at the end of the study. Participants in the yoga group completed satisfaction and credibility ratings concerning the intervention at the final assessment. To help assure participant safety, participants in both groups were contacted when their EPDS scores were $\geq$16 or if they endorsed thoughts of suicide.

2.4. Treatment conditions

2.4.1. Yoga

The yoga intervention consisted of eight consecutive 75-min weekly group classes, delivered to two recruitment waves. During the first wave of the study ($n = 16$), a rolling recruitment method was used and participants were given an 8-week window to attend classes after enrollment. Only 8 classes were taught during the 2nd wave of the study ($n = 7$). Yoga classes were offered one day per week and make up sessions were not available. An expert prenatal yoga instructor, with 18 years of experience teaching yoga generally and 10 years of experience teaching prenatal yoga, delivered classes in a group format, and the class protocol and adherence measure were developed in collaboration with a senior expert yoga practitioner and teacher (MT). Yoga instruction was based on the traditional Ashtanga Vinyasa system of yoga modified for pregnancy. Each yoga class included a series of postures designed for pregnancy and included 5 min of introductory breathing practice, 10 min of synchronizing breath, gaze and movement, 20 min of synchronized standing postures, 20 min of synchronized seated postures, and 20 min of cool down and sitting. Participants received an antenatal yoga instructional video to use for home practice and were asked to record frequency and duration of yoga practice outside of classes provided in the study.

2.4.2. Treatment as usual (TAU)

Participants in both conditions were told there were no restrictions on seeking care for depression or anxiety outside of the study, and were asked to provide information about any non-study treatment received.

2.5. Measures

2.5.1. Demographics and mental health history

2.5.1.1. Demographic information. This questionnaire was a project-designed measure to gather descriptive information about basic demographic variables such as age, race, income and education. The questionnaire contained 25 questions and took approximately 10 min to complete.

2.5.1.2. Structured clinical interview for DSM disorders research version SCID-RV. The Structured Clinical Interview for DSM Disorders Research Version SCID-RV [23] was administered by the research coordinator and used to measure inclusion and exclusion criteria. Time for completion ranged from approximately 30 to

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