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Efficacy of yoga for depressed postpartum women: A randomized controlled trial

Melissa M. Buttner [a, *], Rebecca L. Brock [b], Michael W. O'Hara [b], Scott Stuart [b, c]

[a] VA Center of Excellence for Stress and Mental Health (CESAMH), VA San Diego Healthcare System, and the Department of Psychiatry, University of California San Diego, San Diego, CA 92161, USA
[b] Department of Psychology, University of Iowa, Iowa City, IA 52242, USA
[c] Department of Psychiatry, University of Iowa, Iowa City, IA 52242, USA

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A B S T R A C T

Background: Up to 20% of women experience postpartum depression (PPD). PPD is associated with anxiety and poor health-related quality of life (HRQOL). Efficacious treatments are critical; many women with PPD prefer complementary therapies. Thus, the current study examined yoga as a complementary therapy for PPD.
Methods: Fifty-seven postpartum women with scores ≥12 on the Hamilton Depression Rating Scale were randomly assigned to a yoga ($N = 28$) or wait-list control ($N = 29$) group. The yoga intervention consisted of 16 classes over 8 weeks. Outcomes were depression, anxiety, and HRQOL.
Results: The yoga group experienced significantly greater rate of improvement in depression, anxiety, and HRQOL, relative to the control group with moderate to large effects. Reliable Change Index analyses revealed that 78% of women in the yoga group experienced clinically significant change.
Conclusion: These findings support yoga as a promising complementary therapy for PPD, and warrant large-scale replication studies.
Trial Registration: http://clinicaltrials.gov/NCT02213601.

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1. Introduction

Postpartum depression (PPD) is a significant public health issue with approximately 1 in 4 women experiencing depression following childbirth [1]. Negative consequences include personal suffering, impaired social relationships, and social, emotional, and cognitive delays in exposed children [2]. Antidepressant medications and psychotherapy are efficacious for treating PPD [3,4]; however, medication side effects and stigma associated with mental health treatment diminish uptake of these interventions [5]. Consequently, there is growing interest in complementary therapies for women with perinatal depression [6,7]. These interventions address barriers associated with conventional treatments because they are considered low risk and provide women with a sense of control in improving emotional and physical functioning [7,8].

Comorbid anxiety is prominent in PPD [9,10]. Postpartum prevalence rates of anxiety range from 0.5% to 2.9% for panic disorder to 6.1%–7.7% for generalized anxiety disorder [9], with some studies showing higher rates of GAD during the postpartum period, relative to the general population [10]. Finally, rates for social anxiety disorder range from 0.2% to 6.5% in the early postpartum period [9]. Empirical data to guide interventions for comorbid anxiety and PPD are limited. Evidence-based treatments for anxiety, including SSRIs and Cognitive Behavioral Therapy (CBT), have been used with some success to treat anxiety in depressed postpartum women; nonetheless, high rates of comorbid anxiety during the postpartum period still persist [9,10].

HRQOL is also an important outcome to consider when evaluating the efficacy of interventions for PPD. Boyce et al. [11] examined the impact of depressed mood at 8 weeks postpartum on functioning and well-being at 24 weeks postpartum. Depressed women were significantly more impaired on several scales of the SF-36. Further, Dennis [12] showed that women depressed at 4 and 8 weeks postpartum reported poorer Physical and Mental Health status compared to nondepressed women.

While there is a substantial literature on PPD treatment, PPD remains undertreated. Empirically-validated treatments include sertraline [13], CBT [14] and Interpersonal Psychotherapy (IPT) [15].

* Corresponding author. VA San Diego Healthcare System, 3350 La Jolla Village Dr., San Diego, CA 92161, USA. Tel.: +1 858 642 1425.
E-mail address: Melissa.Buttner@va.gov (M.M. Buttner).

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Pharmacological treatments are recommended for women with severe PPD (e.g., presence of active suicidal ideation, intent or psychosis), either as a standalone or in conjunction with psychotherapy [3]. Breastfeeding mothers are often reluctant to use medication for many reasons, but particularly because they do not want to expose their infants to medication in breastmilk [5,16].

Empirical data suggest that psychotherapy is as efficacious as pharmacotherapy for PPD [4]. Nonetheless, characteristics unique to the postpartum period, including the risks associated with medications, add a layer of complexity in developing efficacious treatments for PPD. Researchers are beginning to study complementary and alternative medicine (CAM) therapies for PPD to broaden the scope of current treatments and to reach more women. Empirical evidence for CAM therapies is growing, with several studies demonstrating the efficacy of yoga for depression and anxiety in the general population [17,18], and prenatal yoga for depression and anxiety in pregnant women specifically [19–23]. Yoga has also outperformed control conditions in reducing depression and anxiety [18,20], and has beneficial effects for improving HRQOL [17].

Yoga is identified as one of the top 10 CAM therapies used among adults for depression [24]. *Hatha*, the physical form of yoga, is the most commonly practiced style of yoga in Western culture [25]. The system of yoga integrates three basic components: breath (*pranayama*), physical poses (*asanas*), and meditation (*dhyana*) [26–28].

The primary objective of this study was to examine the efficacy of yoga for PPD. We hypothesized that women randomized to a yoga condition would improve more rapidly on measures of depression, anxiety, and level of HRQOL over the course of the 8-week intervention relative to a wait-list control (WLC) condition.

2. Methods

2.1. Participants and study procedure

Fifty-seven participants were randomized (Yoga: $N = 28$; WLC: $N = 29$). See Table 1 for sample characteristics and Fig. 1 for participant flow through the study. Participants were recruited using public birth records, local flyers, the university's mass e-mail system, and referrals. Women ages 18 to 45 who gave birth within the past 12 months and could speak and read English were invited to participate. Eligibility criteria included: (1) score ≥ 12 on the HDRS [29]; (2) residence within a 30-mile radius of the yoga studios; and (3) ≥ 6 weeks postpartum if delivery was complicated and/or involved a cesarean section. Participants received 8 weeks of yoga at no cost and received $20 for the pre-treatment assessment and $10 for each assessment during the treatment phase. The study was approved by the University of Iowa's Institutional Review Board, and full consent was obtained from participants.

Table 1
Sociodemographic and intervention characteristics of women recruited to the study.

	Yoga ($n = 28$)[a]	Wait-list control ($n = 29$)		
Continuous variable	M (SD)	M (SD)	Statistic t ($df = 54$)	p
Age	29.81 (5.17)	32.45 (4.78)	1.98	0.053*
Education	16.89 (2.24)	16.38 (2.29)	−0.84	0.404
Mo. postpartum	4.63 (3.47)	4.72 (2.91)	0.11	0.912
No of classes attended[b]	11.46 (4.48)			
Categorical variable	n (%)	n (%)	χ^2 ($df = 1$)	p
Breastfeeding	21 (78%)	21 (72%)	0.25	0.621
Non-Hispanic	26 (96%)	27 (93%)	0.28	1.00
White	24 (89%)	27 (93%)	0.31	0.664
Married	22 (82%)	22 (76%)	0.26	0.609
Primiparous	16 (59%)	12 (41%)	1.79	0.181
Income (≥$50,000)	16 (59%)	19 (65%)	0.23	0.629
Employed	15 (56%)	22 (76%)	2.57	0.109
Past MDE	19 (70%)	16 (55%)	1.38	0.240
Prior yoga experience	13 (48%)	10 (34%)	1.08	0.299
Attended > 9 classes[b]	17 (63%)			

*$p < 0.05$.
[a] Demographic characteristics are only reported for $n = 27$ women who provided this information at the pre-treatment assessment.
[b] These variables are specific to the yoga group; thus, statistics are not provided for the wait-list control group.

2.2. Design

Participants were assessed at pre-treatment, 2 weeks, 4 weeks, 6 weeks, and 8 weeks (post-treatment). During the screening phase of the study, consenting participants provided eligibility information and completed the 9-item Patient Health Questionnaire (PHQ-9) [30]. Participants who met eligibility criteria and had a PHQ-9 score ≥10 were asked to participate in a telephone interview using the Structured Clinical Interview for DSM-IV Axis-I Disorders (SCID-I) [31] and the HDRS. Those scoring ≥12 on the HDRS and not meeting exclusionary criteria based on psychiatric disorders (anorexia, bipolar disorder, personality disorders, psychosis) and poorly controlled medical conditions, were asked to participate in an in–home visit to review study protocol and consent to be randomized. After consenting, participants were given a questionnaire packet (pre-treatment assessment) to return via the mail. Assessors were blind to treatment condition with the exception of the PI who participated in pre-treatment interviews; the PI was blinded to all other assessments.

A 1:1 blocked randomization allocation ratio was used following pre-treatment assessments. Block size varied to ensure that the PI could not predict group assignment for the next participant, and to address potential imbalance with group assignment during the study [32]. For example, with a block of eight participants randomized according to a predetermined ratio of 1:1, four participants were allocated to the yoga group and four to the WLC group.

2.3. Measures

The nine-item Patient Health Questionnaire (PHQ-9) [30] is a depression scale that includes the 9 criteria for diagnosing DSM-IV major depression. The PHQ-9 has high sensitivity (73%–88%) and specificity (88%–98%) in large population-based studies, and is used as an effective screening tool for depression [33]. The SCID-I assesses major Axis I and II psychiatric disorders using the DSM-IV, and was administered to participants in the current study with PHQ-9 scores ≥10, a cut-off score that is predictive of Major Depressive Disorder [33].

The Hamilton Depression Rating Scale (HDRS) [29] is a reliable measure of the severity of current depressive symptoms, and is used extensively in depression treatment studies. The 17-item HDRS was selected as the primary measure of depression because it is sensitive to treatment change in the postpartum population [15], and is a valid indicator of depression severity in PPD [34].

The SCID and HDRS were administered over the telephone by Masters-level clinicians with experience in psychiatric interviewing. All interviews were audiotaped for reliability. The intraclass correlation was 0.98, 95% CI [0.94, 0.99] for the HDRS based on 18 interviews and three separate raters.

The Inventory of Depression and Anxiety Symptoms (IDAS) [35] is a 64-item factor analytically derived, multidimensional inventory that uses a 5-point Likert scale to assess symptoms of depression and anxiety over the past 2 weeks (1 = *not at all* to 5 = *extremely*). The IDAS has strong internal consistency, and has been validated for use in a postpartum sample [35]. We used the General Depression