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## Trauma-sensitive yoga as an adjunct mental health treatment in group therapy for survivors of domestic violence: A feasibility study

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### Abstract

This study is a feasibility test of whether incorporating trauma-sensitive yoga into group therapy for female victims of partner violence improves symptoms of anxiety, depression, and posttraumatic stress disorder (PTSD) beyond that achieved with group therapy alone. Seventeen (9 control, 8 intervention) adult female clients seeking group psychotherapy were enrolled.

A 12-week trauma-sensitive yoga protocol was administered once weekly for 30–40 min at the end of each group therapy session. The control group received typical group psychotherapy. Feasibility was assessed through recruitment and retention rates as well as participants' self-reported perceptions of the safety and utility of the study. The study enrolled 85% (17/20) of those screened eligible. Loss to follow-up was 30% (5/17). No one reported emotional or physical harm.

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Conflict of interest statement

The authors have no competing interests to declare.

### Contributors

Clark acted as guarantor of the integrity of entire study. Clark, Lewis-Dmello, and Anders each contributed to the study's design, secured funding, and supervised data collection. Henn and Emerson also contributed to specific aspects of the study's design. Clark and Nguyen-Feng analyzed the data. Lewis-Dmello, Anders, Parsons, Nguyen-Feng, Henn, and Emerson contributed to the interpretation of the findings. Clark, Lewis-Dmello, Anders, and Parsons each contributed to the drafting of the manuscript. Lewis-Dmello, Anders, Parsons, Nguyen-Feng, Henn, and Emerson critically reviewed the manuscript. Clark and Nguyen-Feng critically revised the manuscript.

All of the respondents reported that the study was personally meaningful and that the results would be useful to others.

## Keywords

Domestic violence; Group psychotherapy; Mind-body therapies; Yoga; Community-based participatory research

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## 1. Introduction

The prevalence of intimate partner violence (IPV) is high [1–4]. Approximately one in three women in the United States reports having experienced rape, physical violence, or stalking by an intimate partner in her lifetime [1]. Survivors of IPV suffer from high levels of depression, anxiety, and posttraumatic stress disorder (PTSD) [6]. Due to serious health consequences of IPV, several professional medical societies, such as the American College of Obstetricians and Gynecologists and the American Medical Association, recommend universal or routine screening for IPV. However, screening for, and detection of, IPV in the health sector is poor and many survivors are never identified [10–15,17]. Therefore, efforts to ameliorate the health effects of exposure to violence may be more effective if integrated into settings where survivors seek help, such as community agencies providing victims'/ survivors' support and therapeutic services.

### 1.1. Yoga and mental health

Several studies have shown that yoga, whether as an adjunct or primary intervention, reduces perceived stress [19–21], and symptoms of anxiety [19–25], depression [19,21,24,25], and PTSD [16,27,28]. Additionally, yoga has been associated with improvements in emotion regulation [29] and in feelings of self-efficacy [30]. In a review of 13 randomized control studies on the effectiveness of yoga, 10 yielded significant positive results for the reduction of psychiatric illnesses including schizophrenia, depression, and PTSD [31].

Studies that demonstrate yoga to be an efficacious intervention for depression and anxiety disorders also suggest it may be beneficial for survivors of trauma [32]. Preliminary research using a model of trauma-sensitive yoga, developed by the Trauma Center at the Justice Resource Institute in Brookline, Massachusetts, has shown a reduction in severity of PTSD symptoms and frequency of dissociative symptoms, and gains in vitality and body attunement [16,35]. Though this yoga intervention has been demonstrated to be efficacious for PTSD and other mental health symptoms related to trauma exposure, it has not been empirically tested in the IPV population.

Very few studies have empirically tested whether yoga is effective at reducing mental health symptoms among IPV survivors. Franzblau et al. [30] demonstrated that yogic breathing alone and in combination with the act of giving testimony, reduced partner violence survivors' depressive symptoms more than the control condition. Another study [36] recruited women from a local yoga studio with the aim of testing whether various aspects of yoga practice mitigated the mental health impact of exposure to violence. In this study,

experiencing violence as an adult and the frequency of yoga practice were independently related to dysfunctional coping but no formal test was conducted to ascertain if the relationship between violence exposure and coping was either mediated or moderated by yoga practice. In related research, the use of mindfulness-based stress reduction with IPV survivors with PTSD was shown to be feasible and acceptable to participants [37] and per an analysis of qualitative data, to result in a wide range of psychosocial benefits [38]. None of the studies examined the role of yoga among IPV survivors seeking group therapy, the format through which numerous survivors seek help. Therefore, further research on the effectiveness of yoga as an adjunctive therapy for IPV survivors seeking help is warranted.

## 1.2. The present study

This study tests the feasibility of a 12-week trauma-sensitive yoga intervention designed to improve the mental health of women receiving group therapy for IPV. Specific components tested included recruitment, safety, acceptability, and participant reaction.

## 2. Methods

### 2.1. Study design overview

The study followed a community-based participatory research approach (CBPR) [39,40] in its conceptualization and design and involved faculty at the University of Minnesota Medical School and staff at the Domestic Abuse Project (DAP), a Minneapolis-based community agency providing advocacy and psychotherapy for men, women, and children affected by domestic violence. The study was a 12-week prospective, two-armed feasibility study of trauma-sensitive yoga incorporated into group therapy versus group therapy alone. The main outcomes measured were depression, anxiety, and PTSD symptoms. The study population consisted of women who had sought group therapy at DAP. All group therapy sessions were conducted through DAP's 12-week Aftercare program. The Aftercare program is open to women who have completed DAP's 16-week Primary group therapy program.

### 2.2. Study participants

Eligible participants included females, aged 18 years or older, who had successfully completed DAP's 16-week Primary group therapy and were seeking services in DAP's Aftercare group. Potential participants were excluded if they were pregnant, unable to provide written informed consent, unable to read or write in English, had behavioral issues as observed by the Primary group therapist that would disrupt Aftercare therapy, or had an injury, heart condition, or other self-reported condition that would preclude them from participating in a mild exercise routine.

### 2.3. Study recruitment

Participants were recruited from DAP's client database, drawing from Primary group therapy completers from 2008 to 2012 who expressed interest in joining an Aftercare group. The identified individuals received a flier in the mail as well as a follow-up phone call about the upcoming Aftercare study groups. Those who expressed interest completed an intake interview including an assessment of whether the potential participant met inclusion criteria.

If the potential participant did not meet the study criteria or was not interested in taking part in the study, she was offered referrals for similar programs in the community or individual therapy services at DAP. Those who expressed interest in participating in the study attended a more detailed information session at which time informed consent was obtained and the baseline questionnaire was administered.

#### 2.4. Intervention protocol

The trauma-sensitive yoga [16] protocol was designed by the Trauma Center at the Justice Resource Institute in Boston, Massachusetts as an adjunct treatment for survivors of complex trauma. This form of yoga incorporates a series of postures and breathing that aim to strengthen the connection to one's self after the body has experienced a traumatic event, from combat to interpersonal violence. Trauma-sensitive yoga [34,41] adapts the environment in which the yoga is delivered in order to fit the needs of the client population, such as removing strongly suggestive language, deemphasizing posture intensity, emphasizing feeling, and eliminating hands-on assists from the teacher. In addition, four key themes are emphasized during the practice including: experiencing the present moment, making choices, taking effective action, and creating rhythms. The originally created protocol was designed to be administered during a weekly yoga class offered at a separate time from the participant's individual therapy session. However, the present study adapted the trauma-sensitive yoga protocol to be utilized during the course of weekly group therapy sessions.

The yoga protocol was administered at the end of each intervention group therapy session by a certified yoga instructor who had been trained in trauma-sensitive yoga by the Director of Yoga Services at the Trauma Center at the Justice Resource Institute. Study participants were led through a series of trauma-sensitive yoga forms (Table 1) for 30–40 min.

In principle, the control and intervention conditions differed only in the administration of the yoga protocol in the intervention group. Both psychotherapy groups were guided by a women's therapy manual developed at DAP and included a combination of psychoeducation and time for participants to process their experiences of domestic violence. The same group therapist led the participants in both groups, and both groups ended each session with the completion of study questionnaires. However, the psychotherapeutic portion of the intervention group had to be shortened by 15 min and the entire session was lengthened to 2 h and 15 min to accommodate the yoga protocol. The control group was approximately 2 h in length.

#### 2.5. Group placement and study blinding

Availability sampling was used in order to place participants in either the trauma-sensitive yoga group therapy or the traditional group therapy conditions, with the former designated as the intervention group. The two 12-week group therapy sessions were conducted sequentially. The group therapist and yoga instructor referred to any breathing, stretching, and relaxation exercises as mind-body exercises in order to blind the participants to their group assignment. Very short breathing, stretching, and relaxation exercises are often a

typical part of group therapy at DAP. However, these are typically administered for only a few minutes at select times. Only the intervention group received the yoga protocol.

## 2.6. Feasibility outcomes

The main aim of the study was to test the feasibility of incorporating a trauma-sensitive yoga practice in a 12-week group therapy intervention for survivors of domestic violence. This was assessed through the effectiveness of the study recruitment process, retention rates, the participants' self-reported level of acceptance of the yoga intervention, and the study participants' perceptions of the safety and utility of participating in the study. Effective recruitment was defined as a 75% baseline participation rate among the eligible pool of Primary group completers expressing interest in the study, with a goal of 12 participants per condition. Additionally, high retention was defined as having 75% of consenting participants complete both pre- and post-intervention measures and the majority of group therapy sessions; thus, an attrition rate of no more than 25% was desirable. The research team determined these figures from comparable dropout rates in studies of various types of group therapy in the literature [42,43]. Items from the Reactions to Research Participation Questionnaire (RRPQ) [44,45] were used to measure the participants' emotional reactions to the questionnaires as well as the participants' perceptions of the study's adherence to research ethics and perceived gains and drawbacks. Additional items (e.g. "The breathing, relaxation, and stretching exercises were not too emotionally challenging for me") were added to this measure to assess the participants' perceptions of the acceptability and safety of the breathing, relaxation, and stretching exercises in the intervention group.

## 2.7. Primary outcomes

The intervention was designed to improve participant self-reported levels of depression, anxiety, and PTSD symptoms between and within condition groups. Depression was measured weekly with the Hospital Anxiety and Depression Scale (HADS) [46] depression subscale and every four weeks with the Patient Health Questionnaire, version 9 (PHQ-9) [48–50]. Anxiety was measured weekly with the HADS anxiety subscale and at the pre and post time intervals with the State-Trait Anxiety Inventory (STAI) [51]. PTSD was measured at baseline by the Posttraumatic Stress Diagnostic Scale, Parts I and II (PDS) [52]. After the first administration it was clear that this measure was not suitable for the study population. Many study participants had a complex traumatic history and reported difficulty in identifying an index trauma. Therefore, at week 4, this scale was replaced by the PTSD Checklist – Civilian Version (PCL-C) [53]. Demographic information was obtained from the intake interview and baseline questionnaire (e.g. age, race, highest level of education, self-care, relationship status, mental health service or therapy utilization, psychiatric medication, alcohol and drug usage).

## 2.8. Statistical analysis

Descriptive statistics were tabulated for the socio-demographic characteristics of the participants, the study's primary outcomes, and feasibility measures. Percent agreement with the various participant reaction items was tabulated both at baseline and again at last measurement for each participant. Differences in distribution of affirmative responses between baseline and final measurement were examined using Fisher's Exact Test.

## 2.9. Safety and ethical considerations

The research took place in a community agency, DAP, that had extensive policies and procedures designed to protect clients' physical and emotional well-being. Risk of harm was assessed for the trauma-sensitive yoga intervention with proper exclusion criteria taken into account. Participants were able to choose to modify or opt out of any postures that they found uncomfortable, and the group therapist and yoga teacher were attentive during sessions to signs of discomfort in the participants in order to make appropriate accommodations as necessary.

Participants were encouraged to take their time in completing the questionnaires, to discuss their feelings regarding the questionnaires with research team members or the group therapists, or to skip items that were triggering or sensitive to them. Further, as part of the feasibility test, participants were assessed at each session for any harm as a result of the study as well as whether the trauma-sensitive yoga exercises felt too physically demanding or emotionally challenging. Respondent's perceptions of key human subjects' considerations (e.g. voluntary participation, being treated with respect and dignity, being able to withdraw at any time) were monitored every 4 weeks.

The research study was approved by the Institutional Review Board at the University of Minnesota. Additionally, the study obtained a Certificate of Confidentiality through the National Center for Complementary and Alternative Medicine to protect participants from having information associated with the study subpoenaed into court proceedings.

## 3. Results

### 3.1. Baseline characteristics

Due to the small total sample size ( $n = 17$ ), baseline characteristics were determined for the sample as a whole instead of each condition separately (trauma-sensitive yoga:  $n = 8$ , group therapy as usual:  $n = 9$ ). Table 2 reflects the baseline socio-demographic characteristics of survivors of IPV who consented to participate in the study. On average participants were 43 years of age. The majority of women were white ( $n = 12$ , 70.6%) and all but three women had greater than a high school education. At baseline, the majority of women ( $n = 11$ , 64.7%) had sought medical or mental health services as a result of the abuse since completing Primary group therapy. Nine of the women (52.9%) self-reported currently taking psychiatric medication, though none had been hospitalized for psychiatric reasons since Primary group. The majority of women did not use drugs ( $n = 15$ , 88.2%) or consume alcohol ( $n = 12$ , 70.6%). However, two of the five women who consumed alcohol stated that they imbibed every day while the remaining three stated using alcohol less than once a week. Seven women (41.2%) had a history of previous drug use.

At baseline, three of the women (17.6%) stated that they were still married to their perpetrator. Most women ( $n = 10$ , 58.8%) listed some form of contact with their abuser, whether it be currently living with their abuser ( $n = 3$ , 17.6%), contact in person ( $n = 8$ , 47.1%), contact via phone ( $n = 8$ , 47.1%), contact via electronic media including email or text ( $n = 6$ , 35.3%), or contact via a third party ( $n = 4$ , 23.5%). Of the individuals who had

current contact with their abuser, all listed the interaction as stressful in some manner, ranging from “a little” to “very” stressful.

### 3.2. Feasibility findings

The study successfully recruited 85% (17/20) of those screened eligible (9 control, 8 intervention) but fell short of the planned 12 participants per condition. Upon conclusion of the two 12-week groups, six individuals remained in both conditions (30% dropout). Two participants dropped out from the trauma-sensitive yoga group therapy condition (25%) while three dropped out from the group therapy as usual condition (33.3%). Dropouts occurred throughout the study. No participant was emotionally or physically harmed by participating in the study and yoga was not too emotionally or physical challenging for the intervention participants. Table 3 summarizes items on the RRPQ that measured the participants' reactions to the study at baseline and either at week-12 or for those who did not complete the study, the last week of attendance.

Throughout the study, participants felt that their rights were upheld. While the questionnaires were emotionally difficult for half of the sample, less than a quarter reported that these emotions were intense and almost every participant (94%) reported that if had they known in advance what participating would be like, they would still have agreed to participate. All of the respondents reported that the study was personally meaningful and that the results will be useful to others. These findings, however, do not include data from one client who reported difficulty in answering the questionnaire items. Since a significant amount of the questionnaire items to which she responded had multiple answers, many of which were irreconcilable, it was impossible to use more than her intake data for analysis purposes. Therefore, participant reaction and the primary mental health outcomes (reported below) were calculated on a maximum of 16 participants.

### 3.3. Primary outcomes

The primary outcomes of interest were anxiety, depression, and PTSD symptoms. These measures are summarized in Table 4. Most notably at baseline, 60.0% ( $n = 9$ ) of the study population had clinically significant levels of depressive symptoms (PHQ-9 score  $\geq 10$ , HADS score  $\geq 8$ ). Nearly all (86.7%,  $n = 13$ ) had clinically significant levels of anxiety (HADS score  $\geq 8$ ; mean STAI = 45.9) and 50% ( $n = 7$ ) had PCL-C scores ( $\geq 44$ ) indicative of PTSD.

## 4. Discussion

This study demonstrated the safety and acceptability of incorporating trauma-sensitive yoga into community-based psychotherapy groups for IPV survivors. While the pool of eligible clients was smaller than anticipated, the study exceeded recruitment expectations among those eligible. The attrition rate for the intervention condition (25% dropout) fell within our definition of successful retention (25% dropout) though the control condition fell slightly short (33% dropout). The trauma-sensitive yoga protocol was ideal for the study population, as there was a gradual increase in the difficulty of yoga forms, an emphasis on choice, and a fit for all levels of previous yoga experience and physical fitness. Study participants were

engaged and reported enthusiasm about the incorporation of a yoga intervention into group therapy. One participant commented, “I didn’t have to leave the meeting with anxiety... I was able to leave it on the mat.”

Similar to other violence- and trauma-focused research [54,55], the participants in this study were not harmed, were grateful for the opportunity to contribute, and felt that the study would benefit others.

The CBPR model was essential to the success of the pilot. While the study faced challenges similar to those highlighted in the literature (e.g. sustained commitment to power sharing and collective action was time-consuming) [39], the approach also realized many of the benefits noted including a higher quality, more relevant intervention that is attuned to the financial and physical constraints of a busy community agency, mutual benefit and professional development among all team members, and broader and more diversified dissemination of the research findings [39,56]. The presence of the study and the accompanying grant resources ensured that these groups were available to clients during a financial crisis and the success of the pilot has spurred additional fund-raising activity at the agency. Fundamentally, the integration of the study protocol into the group therapy setting was only possible with the combined knowledge, skill set, commitment, and support of the study team and broader therapeutic and administrative staff at DAP. This level of community engagement and participation is only possible through a CBPR framework.

Yet this study was subject to limitations aside from the small sample size, which was determined a priori. First, long-term effects were not measured beyond 12 weeks and the study was not powered to detect differences by study condition. Secondly, the study was pilot-tested at one agency in its Aftercare population. A future trial will likely require the collaboration of multiple service providing agencies and many do not offer Aftercare services. A scaled-up study would likely need to be conducted among primary group attendees, who are typically in a less stable point in their healing process. Prior research among IPV survivors has demonstrated similar or higher dropout rates than that found in this pilot [57]. Therefore, scaling up the study will likely require more resources for recruitment and retention and the collaboration of multiple agencies. Finally, though trauma-sensitive yoga group therapy was deemed to be feasible to conduct, this group required slightly more resources than the therapy as usual group. As part of the commitment to mutual benefit and to ensure that the benefits of the study extend beyond those directly involved in the research, therapists at DAP became trained throughout the study process to incorporate yoga into their group practice so that they may continue the work well after the study is completed. However, limited access to affordable continuing education and a community of support for therapists using these techniques was noted through an ancillary study of the benefits of mind-body practices from the group therapist’s perspective that accompanied the pilot. These are important considerations for the intervention’s sustainability and for its relevance to service environments where physical and financial resources are scarce.

Yoga is a natural extension of existing breathing exercises and meditation in many of DAP’s group therapy programs. Likewise, the practice of yoga entails very few adverse side effects

[58–62], requires little to no equipment, and can be conducted in the same space as traditional group therapy, reducing logistical concerns. The growing body of literature supporting the use of yoga as an adjunctive treatment for a number of mental health conditions suggests that it is a promising tool for partner violence survivors seeking group therapy. Given the well-documented burden of mental health diagnoses in this population, further research using safe, low-cost, effective interventions, such as yoga is warranted. This feasibility test is one promising step in this direction.

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## References

1. Black, MC.; Basile, KC.; Breiding, MJ.; Smith, SG.; Walters, ML.; Merrick, MT., et al. National intimate partner and sexual violence survey: 2010 summary report. Atlanta, GA: National Center for Injury Prevention and Control and the Centers for Disease Control and Prevention; 2011.
2. Jewkes R. Intimate partner violence: causes and prevention. *Lancet*. 2002; 359:1423–9. [PubMed: 11978358]
3. Breiding MJ, Black MC, Ryan GW. Prevalence and risk factors of intimate partner violence in eighteen U.S. states/territories. *Am J Prev Med*. 2008; 34:112–8. <http://dx.doi.org/10.1016/j.amepre.2007.10.001>. [PubMed: 18201640]
4. Tjaden, P.; Thonnes, N. Full report of the prevalence, incidence, and consequences of violence and women: findings from the national violence against women survey. Washington, DC: National Institute of Justice and the Centers for Disease Control and Prevention; 2000.
6. Golding JM. Intimate partner violence as a risk factor for mental disorders: a meta-analysis. *J Fam Violence*. 1999; 14:99–132. <http://dx.doi.org/10.1023/A:1022079418229>.
10. Chamberlain L, Perham-Hester KA. Physician's screening practices for female partner abuse during prenatal visits. *Matern Child Health J*. 2000; 4:141–8. <http://dx.doi.org/10.1023/A:1009530523057>. [PubMed: 10994583]
11. Rodriguez MA, Bauer HM, McLouglin E, Grumbach K. Screening and intervention for intimate partner abuse: practices and attitudes of primary care physicians. *JAMA*. 1999; 282:468–74. <http://dx.doi.org/10.1001/jama.282.5.468>. [PubMed: 10442663]
12. Gerbert B, Gansky SA, Tang JW, McPhee SJ, Carlton R, Herzig K, et al. Domestic violence compared to other health risks: a survey of physicians' beliefs and behaviors. *Am J Prev Med*. 2002; 23:82–90. [http://dx.doi.org/10.1016/S0749-3797\(02\)00460-9](http://dx.doi.org/10.1016/S0749-3797(02)00460-9). [PubMed: 12121795]
13. Lapidus G, Cooke MB, Gelven E, Sherman K, Duncan M, Banco L. A statewide survey of domestic violence screening behaviors among pediatricians and family physicians. *Arch Pediatr Adolesc Med*. 2002; 156:332–6. <http://dx.doi.org/10.1001/archpedi.156.4.332>. [PubMed: 11929365]
14. Kothari CL, Rhodes KV. Missed opportunities: emergency department visits by police-identified victims of intimate partner violence. *Ann Emerg Med*. 2006; 47:190–9. <http://dx.doi.org/10.1016/j.annemergmed.2005.10.016>. [PubMed: 16431233]

15. Rhodes KV, Kothari CL, Dichter M, Cerulli C, Wiley J, Marcus S. Intimate partner violence identification and response: time for a change in strategy. *J Gen Intern Med.* 2011; 26:894–9. <http://dx.doi.org/10.1007/s11606-011-1662-4>. [PubMed: 21404130]
16. van der Kolk B, Stone L, West J, Rhodes A, Emerson D, Suvak M, et al. Yoga as an adjunctive treatment for Posttraumatic Stress Disorder: a randomized controlled trial. *J Clin Psychiatry.* 2014 [in press]. 10.4088/JCP.13m08561
17. Plichta SB. Interactions between victims of intimate partner violence against women and the health care system: policy and practice implications. *Trauma Violence Abuse.* 2007; 8:226–39. <http://dx.doi.org/10.1177/1524838007301220>. [PubMed: 17545576]
19. Raghavendra RM, Vadiraja HS, Nagarathan R, Nagendra HR, Rekha M, Vanitha N, et al. Effects of a yoga program on cortisol rhythm and mood states in early breast cancer patients undergoing adjuvant radiotherapy: a randomized controlled trial. *Integr Cancer Ther.* 2009; 8:37–46. <http://dx.doi.org/10.1177/1534735409331456>. [PubMed: 19190034]
20. Beddoe AE, Yang CP, Kennedy HP, Weiss SJ, Lee KA. The effects of mindfulness-based yoga during pregnancy on maternal psychological and physical distress. *J Obstet Gynecol Neonatal Nurs.* 2009; 38:310–9. <http://dx.doi.org/10.1111/j.1552-6909.2009.01023.x>.
21. Lin KY, Hu YT, Chang KJ, Lin HF, Tsauo JY. Effects of yoga on psychological health, quality of life, and physical health of patients with cancer: a meta-analysis. *Evid Based Complement Alternat Med.* 2011; 2011:1–12.10.1155/2011/659876
22. Javnbakht M, Hejazi Kenari R, Ghasemi M. Effects of yoga on depression and anxiety of women. *Complement Ther Clin Pract.* 2009; 15:102–4. <http://dx.doi.org/10.1016/j.ctcp.2009.01.003>. [PubMed: 19341989]
23. Telles S, Singh N, Joshi M, Balkrishna A. Posttraumatic stress symptoms and heart rate variability in Bihar flood survivors following yoga: a randomized controlled study. *BMC Psychiatry.* 2010; 10:18–28. <http://dx.doi.org/10.1186/1471-244X-10-18>. [PubMed: 20193089]
24. Shapiro D, Cook IA, Davydoy DM, Ottaviani C, Leuchter AF, Abrams M. Yoga as a complementary treatment of depression: effects of traits and moods on treatment outcome. *Evid Based Complement Alternat Med.* 2007; 4:493–502.10.1093/ecam/nel114 [PubMed: 18227917]
25. Kozasa EH, Santos RF, Rueda AD, Benedito-Silva AA, De Ornellas FL, Leite JR. Evaluation of Siddha Samadhi Yoga for anxiety and depression symptoms: a preliminary study. *Psychol Rep.* 2008; 103:271–4. <http://dx.doi.org/10.2466/pr0.103.1.271-274>. [PubMed: 18982958]
27. van der Kolk BA. Clinical implications of neuroscience research in PTSD. *Ann N Y Acad Sci.* 2006; 1071:277–93. <http://dx.doi.org/10.1196/annals.1364.022>. [PubMed: 16891578]
28. Kirlin, M. Thesis. Pacific University; 2010. Yoga as an adjunctive treatment for PTSD in Latina women: a review of the evidence and recommendation for implementation. <<http://commons.pacificu.edu/spp/133>> [accessed Dec 2013]
29. Gootjes L, Franken IHA, Van Strien JW. Cognitive emotion regulation in yogic meditative practitioners: sustained modulation of electrical brain potentials. *J Psychophysiol.* 2011; 25:87–94. <http://dx.doi.org/10.1027/0269-8803/a000043>.
30. Franzblau SH, Smith M, Echevarria S, Van Cantfort TE. Take a breath, break the silence: the effects of yogic breathing and testimony about battering on feelings of self-efficacy in battered women. *Int J Yoga Therap.* 2006; 16:49–57. <http://dx.doi.org/10.1177/0886260508314329>.
31. Meyer HB, Katsman A, Sones AC, Auerbach DE, Ames D, Rubin RT. Yoga as an ancillary treatment for neurological and psychiatric disorders: a review. *J Neuropsychiatry Clin Neurosci.* 2012; 24:152–64. <http://dx.doi.org/10.1176/appi.neuropsych.11040090>. [PubMed: 22772663]
32. Telles S, Singh N, Balkrishna A. Managing mental health disorders resulting from trauma through yoga: a review. *Depress Res Treat.* 2012; 2012:1–9. <http://dx.doi.org/10.1155/2012/401513>.
34. Emerson D, Sharma R, Chaudry S, Turner J. Trauma-sensitive yoga: principles, practice, and research. *Int J Yoga Therap.* 2009; 19:123–5.
35. West, JI. *Moving to heal: women's experiences of therapeutic yoga after complex trauma.* Ann Arbor, MI: ProQuest; 2011.
36. Dale LP, Carroll LE, Galen GC, Schein R, Bliss A, Mattison AM, et al. Yoga practice may buffer the deleterious effects of abuse on women's self concept and dysfunctional coping. *J Aggress Maltreat Trauma.* 2011; 20:90–102.10.1080/10926771.2011.538005

37. Dutton MA, Bermudez D, Matás A, Majid H, Myers NL. Mindfulness-based stress reduction for low-income, predominantly African American women with PTSD and a history of intimate partner violence. *Cogn Behav Pract*. 2013; 20:23–32. [PubMed: 24043922]
38. Bermudez D, Benjamin MT, Porter SE, Saunders PA, Myers NA, Dutton MA. A qualitative analysis of beginning mindfulness experiences for women with post-traumatic stress disorder and a history of intimate partner violence. *Complement Ther Clin Pract*. 2013; 19:104–8. <http://dx.doi.org/10.1016/j.ctcp.2013.02.004>. [PubMed: 23561069]
39. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998; 19:173–202. [10.1146/annurev.publhealth.19.1.173](https://doi.org/10.1146/annurev.publhealth.19.1.173) [PubMed: 9611617]
40. Minkler, M.; Wallerstein, N. Community-based participatory research for health: from process to outcome. San Francisco, CA: John Wiley & Sons; 2008. p. 8-11.
41. Emerson, D.; Hopper, E. Overcoming trauma through yoga: reclaiming your body. Berkeley, CA: North Atlantic Books; 2012.
42. Otto MW, Pollack MH, Gould RA, Worthington JJ, McArdle ET, Rosenbaum JF, et al. A comparison of the efficacy of clonazepam and cognitive-behavioral group therapy for the treatment of social phobia. *J Anxiety Disord*. 2000; 14:345–58. [http://dx.doi.org/10.1016/S0887-6185\(00\)00027-X](http://dx.doi.org/10.1016/S0887-6185(00)00027-X). [PubMed: 11043885]
43. Kissane DW, Grabsch B, Clarke DM, Smith GC, Love AW, Bloch S, et al. Supportive-expressive group therapy for women with metastatic breast cancer: survival and psychosocial outcome from a randomized controlled trial. *Psychooncology*. 2007; 16:277–286. <http://dx.doi.org/10.1002/pon.1185>. [PubMed: 17385190]
44. Newman E, Willard T. Empirically supported ethical research practice: the costs and benefits of research from the participants' point of view. *Account Res*. 2001; 8:309–29. [10.1080/08989620108573983](https://doi.org/10.1080/08989620108573983) [PubMed: 12481796]
45. Kassam-Adams N, Newman E. The reactions to research participation questionnaires for children and for parents. *Gen Hosp Psychiatr*. 2002; 24:336–42. [http://dx.doi.org/10.1016/S0163-8343\(02\)00200-1](http://dx.doi.org/10.1016/S0163-8343(02)00200-1).
46. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983; 67:361–70. <http://dx.doi.org/10.1111/j.1600-0447.1983.tb09716.x>.
48. Martin A, Rief W, Klaiberg A, Braehler E. Validity of the brief patient health questionnaire mood scale (PHQ-9) in the general population. *Gen Hosp Psychiatr*. 2006; 28:71–7. <http://dx.doi.org/10.1016/j.genhosppsy.2005.07.003>.
49. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, et al. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. *Ann Fam Med*. 2010; 8:348–53. <http://dx.doi.org/10.1370/afm.1139>. [PubMed: 20644190]
50. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001; 16:606–13. <http://dx.doi.org/10.1046/j.1525-1497.2001.016009606.x>. [PubMed: 11556941]
51. Spielberger, CD.; Gorsuch, RL.; Lushene, RE. State-trait anxiety inventory. Menlo Park, CA: Consulting Psychologists Press; 1970.
52. Foa EB, Cashman L, Jaycox L, Perry K. The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. *Psychol Assess*. 1997; 9:445–51. <http://dx.doi.org/10.1037/1040-3590.9.4.445>.
53. Weathers, F.; Ford, J. Psychometric review of PTSD checklist (PCL-C, PCL-S, PCL-M, PCL-PR). In: Stamm, BH., editor. Measurement of stress, trauma, and adaptation. Lutherville, MD: Sidran Press; 1996. p. 250-1.
54. Clark CJ, Shahrouri M, Halasa L, Khalaf I, Spencer R, Everson-Rose S. A mixed methods study of participant reaction to domestic violence research in Jordan. *J Interpers Violence*. 2012; 27:1655–76. <http://dx.doi.org/10.1177/0886260511430383>. [PubMed: 22203623]
55. Sikweyiya Y, Jewkes R. Perceptions and experiences of research participants on gender-based violence community based survey: implications for ethical guidelines. *PLoS One*. 2012; 7:e35495. <http://dx.doi.org/10.1371/journal.pone.0035495>. [PubMed: 22558160]

56. Jagosh J, Macaulay AC, Pluye P, Salsberg J, Bush PL, Henderson J, et al. Uncovering the benefits of participatory research: implications of a realist review for health research and practice. *Milbank Q.* 2012; 90:311–46. <http://dx.doi.org/10.1111/j.1468-0009.2012.00665.x>. [PubMed: 22709390]
57. Warshaw, C.; Sullivan, CM.; Rivera, EA. A systematic review of trauma-focused interventions for domestic violence survivors. Chicago, IL: National Center on Domestic Violence, Trauma & Mental Health; 2013.
58. Field T. Yoga clinical research review. *Complement Ther Clin Pract.* 2011; 17:1–8. <http://dx.doi.org/10.1016/j.ctcp.2010.09.007>. [PubMed: 21168106]
59. Chong CS, Tsunaka M, Tsang HW, Chan EP, Cheung WM. Effects of yoga on stress management in healthy adults: a systematic review. *Altern Ther Health Med.* 2011; 17:32–8. [PubMed: 21614942]
60. Jayasinghe SR. Yoga in cardiac health (a review). *Eur J Prev Cardiol.* 2004; 11:369–75. <http://dx.doi.org/10.1097/01.hjr.0000206329.26038.cc>.
61. Raub JA. Psychophysiological effects of hatha yoga on musculoskeletal and cardiopulmonary function: a literature review. *J Altern Complement Med.* 2002; 8:797–812. <http://dx.doi.org/10.1089/10755530260511810>. [PubMed: 12614533]
62. Ross A, Thomas S. The health benefits of yoga and exercise: a review of comparison studies. *J Altern Complement Med.* 2010; 16:3–12. <http://dx.doi.org/10.1089/acm.2009.0044>. [PubMed: 20105062]

**Table 1**

Forms used during the 12 week intervention.

1) Chair practice	Breath awareness and elongation
	Seated mountain form
	Head drop/flexion/head rolls
	Shoulder rolls with elbows on shoulders
	Breathing and moving (hands raise, hands open/close, sun breath)
	Twist
	Sun breath
	Seated cat and dog
	Leg raise
	Forward fold
2) Standing practice	Mountain
	Standing sun breath
	Warrior I
	Warrior II
	Tree
3) Mat practice—seated	Easy pose
	Torso circles
	Head to knee pose
	Sage twist
	Seated forward fold
4) Mat practice—prone	Knees-to-belly
	Extension
	Knees side-to-side
	Bridge
	Knee-down twist
	Reclining leg stretch
	Knee-to-chest
	Prone figure four

**Table 2**

Baseline socio-demographic characteristics of the sample.

	<i>n</i>	%
<i>Age, mean (sd)</i>	17	42.6 (9.0)
<i>Race</i>		
White	12	70.6
African American	1	5.9
Latina	1	5.9
Native American	1	5.9
Other	2	11.8
<i>Highest level of education completed</i>		
Less than high school	1	5.9
High school	2	11.8
Some college	3	17.6
Four-year college	9	52.9
Graduate school	2	11.8
<i>Relationship status</i>		
Married	3	17.6
Divorced	4	23.5
Separated	7	41.2
No longer dating	3	17.6

**Table 3**

Participant reactions to the study, pre and post.

Question	<i>n</i> (pre, post/exit)	Baseline % yes	Final/exit % yes
Participation was a choice I freely made.	16, 14	100	100
I was treated with respect and dignity.	16, 14	100	100
I trust that my replies will be kept private.	16, 13	100	100
I understood the consent form.	16, 14	100	100
I felt I could stop participating at any time.	16, 14	100	100
The questionnaire raised emotional issues for me that I had not expected.	15, 16	55	50
The questionnaire made me think about things I didn't want to think about.	16, 16	56	38
I experienced intense emotions taking this questionnaire.	16, 16	25	19
I feel emotionally harmed by my participation in this study.	16, 16	0	0
Had I known in advance what participating would be like I still would have agreed to participate.	15, 16	100	94
I found participating in this study personally meaningful.	13, 15	100	100
I believe this study's results will be useful to others.	15, 15	100	100
I was glad to be asked to participate.	–, 12		100
I found participating beneficial to me.	–, 12		100
The study procedures took too long.	–, 12		17
I found the questions too personal.	–, 12		8
I think this research is for a good cause.	–, 12		100

Note: – not asked at baseline. Pre *n* less than 16 denotes missing data.

**Table 4**

Average baseline mental health characteristics of the sample (primary outcomes).

Measure	<i>n</i>	Mean	Sd
PHQ-9	15	12.4	6.5
HADS-depression	15	8.1	3.5
HADS-anxiety	15	12.9	5.1
STAI	16	45.9	13.3
PCL-C	14	43.7	11.7

Notes: PHQ-9 = Patient Health Questionnaire-9; HADS = Hospital Anxiety and Depression Scale; STAI = State-Trait Anxiety Inventory; PCL-C = Posttraumatic Stress Disorder (PTSD) Checklist – Civilian Version. *n* less than 16 denotes missing data.