Research

Embodied Resilience: A Quasi-Experimental Exploration of the Effects of a Trauma-Informed Yoga and Mindfulness Curriculum in Carceral Settings

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Abstract

Individuals who are incarcerated likely experience trauma or exacerbate existing trauma, which has significant health risks. Trauma-informed care aims to address the experienced trauma. The current study explored the effect of a trauma-informed yoga and mindfulness curriculum in carceral settings. In this quasi-experimental study, participants (n = 326) were assigned to either six weekly sessions of 60-minute group trauma-informed yoga and mindfulness or a waitlist control condition. Stress and mood were measured pre- and postclass, whereas coping, emotional awareness, emotional regulation, anxiety, anger management, compassion, self-compassion, forgiveness, and posttraumatic growth were measured pre- and postcurriculum. The trauma-informed group showed a significant increase in mood and decrease in stress after participation in class. Participants were more likely to use positive coping skills, experienced greater levels of forgiveness, and were more likely to experience posttraumatic growth after completing programming as compared to a control group. Qualitative data highlighted perceived improvements in mood, physical health, communication with peers, coping with anxiety and anger, focus and self-control, optimism, acceptance, and open-mindedness. The qualitative data also demonstrated the importance of supportive relationships outside of participants' peers (i.e., instructors). Outcomes suggest benefit of a trauma-informed yoga and mindfulness curriculum in aiding people who are incarcerated in supporting mental and physical well-being and building resilience. *Rousseau et al. Int J Yoga Therapy 2024(34). doi: 10.17761/2024-D-23-00007.*

Keywords: trauma-informed, yoga, incarceration, resilience, mindfulness

Abbreviation Used

PTSD = posttraumatic stress disorder

Introduction

Mass incarceration constitutes a public health crisis that disproportionately affects structurally marginalized people.[1] The United States has the highest incarceration rate in the world, with more than 2 million people incarcerated.[2] Rates of acute and chronic health conditions are higher for those incarcerated compared to the general population.[1,3] The longer an individual is incarcerated, the higher the risk of chronic stress, which in turn increases vulnerability to adverse health impacts and premature death.[1,3,4] Incarceration additionally affects mental health, with 1 in 7 people incarcerated in state and federal facilities and 1 in 4 people incarcerated in jails meeting criteria for serious psychological distress.[5] Women who are incarcerated demonstrate higher rates of trauma and mental health diagnoses.[5–7]

Although the prevalence of threats to mental and physical well-being can in part be attributed to structural determinants and experiences before incarceration, incarceration itself is associated with adverse outcomes.[1] Incarceration impacts mental and physical health through multiple pathways, including lack of medical and mental health services; experience of physical, emotional, and sexual violence; poor environmental conditions; solitary confinement; and the separation of people from their

families and communities.[8] These experiences and their lasting effects extend beyond the incarcerated individual to families and communities. The significant impact of traumatic stress experienced by those who are incarcerated suggests the need for interventions that support both physical and psychological well-being.

Why Yoga and Mindfulness?

Because of the mental and physical effect of trauma, a holistic approach should be considered.[9,10] Growing evidence suggests the value of yoga and mindfulness in support of well-being and resilience. Although much remains to be learned regarding the mechanisms by which yoga- and mindfulness-based interventions support well-being and resilience, these practices appear to strengthen both top-down (brain to body) and bottom-up (body to brain) regulation.[11–13] Guendelman et al.[12] proposed an embodied emotion regulation framework, recognizing the distinction between top-down strategies based on attention and acceptance and bottom-up strategies addressing embodied emotional states. These mechanisms can help to explain the efficacy of mindfulness-based interventions in support of well-being. More specifically, yoga and mindfulness are recognized as effective methods for regulating the stress response, supporting autonomic balance, and promoting physical and mental well-being, including reducing symptoms of anxiety, depression, and posttraumatic stress disorder (PTSD).[14–19] Yoga programming has been shown to mitigate the effects of trauma and improve self-esteem.[11,19–24]

Benefits of Yoga and Mindfulness in Carceral Settings

Previous studies have shown evidence-based interventions (e.g., yoga or meditation) within carceral settings to be effective in improving individuals' physical and psychological health.[25–28] A systematic review and meta-analysis of yoga and mindfulness-based programs within the carceral context concluded that interventions can significantly increase incarcerated individuals' psychological well-being and behavioral functioning.[25] People who are incarcerated often experience difficulties with sleep quality and cognitive functioning (e.g., attention, concentration, and planning).[29,30] A recent review demonstrated that prison-based yoga interventions helped to improve distress, paranoid ideation, memory problems, concentration, obsessive thought, somatization, hostility, nervousness, depressive symptoms, self-esteem, self-compassion, and mindfulness.[31] Hatha-based yoga interventions have been shown to improve stress, distress, positive affect, anxiety, locus of control, confidence, and self-control among individuals in carceral settings.[32] Furthermore, preliminary evidence suggests yoga's impact on reducing recidivism[33,34] and outcomes postincarceration.[31]

Trauma-Informed Care

Using a trauma-informed approach in jails and prisons acknowledges trauma histories of those involved in the criminal legal system, as well as the experience of trauma that can occur in carceral settings. Trauma-informed services are typically guided by principles including safety, trustworthiness, and transparency; peer support, collaboration, and mutuality; empowerment and choice; and cultural, historical, and gender issues.[35] Trauma-informed yoga is characterized by a practice that is consistent, predictable, invitational, orienting, and nondirective.[36] The goal is to create as safe a space and practice as possible, while acknowledging that safety can never be guaranteed.[36] This type of embodied practice can facilitate physical and emotional healing and help to build the resilience of those affected by trauma.

Trauma-informed yoga cultivates compassion and collaboration and promotes awareness and choice with the body (e.g., choosing modifications[37]). Trauma-informed yoga intentionally takes the effect of trauma into account and shifts the focus from the physical expression of yoga to the internal embodiment and awareness of the participant.[38] The practice recognizes the impact of a traumatic experience, as well as the ways in which yoga itself has the potential to affect participants both negatively and positively. Even with the best intentions and careful planning, anticipating and controlling every potential response is difficult. Each person's unique history, life experiences, and triggers may emerge during their yoga practice. For example, a particular yoga shape or cue may unintentionally remind a participant of a traumatic event, resulting in an emotional or physiological response. In such instances, despite the yoga teacher's efforts to create a safer environment, the individual may experience distress. This reality highlights the complex and individual nature of trauma and its effects.

In *Best Practices for Yoga in the Criminal Justice System* and *Yoga and Resilience: Empowering Practices for Survivors of Sexual Trauma,* the Yoga Service Council offers guidelines for trauma-informed teaching specific to carceral settings.[36,39] These recommendations include paying specific attention to institutional policy and safety guidelines. Instructors should be aware of institutional protocol, including how to support students should their trauma become activated during class (e.g., reaching out to the mental health department or on-call crisis clinician).

Research to date suggests that trauma-informed yoga may result in decreased symptoms of anxiety, depression, and PTSD.[17,40] Tibbits et al.[41] found decreased pain and negative emotionality and improved self-regulation with trauma-informed yoga implemented within carceral, substance use, and mental health populations. Similarly, veteran women who experienced military sexual trauma found that trauma-informed yoga improved diet, exercise, and sleep and decreased pain and the use of alcohol and medication. Results showed acute reductions in negative affect following yoga sessions, improved mindfulness, decreased experience of shame, and decreased dysregulation.[42] Danielly and Silverthorne[43] examined a 10-week trauma-focused yoga intervention for women who were incarcerated and found it to be an effective method for reducing depressive symptoms and perceived stress levels, as well as improving self-control and self-awareness. Additionally, in a pilot study of a 16-session trauma-informed peer-facilitated yoga curriculum implemented in a

carceral facility for women, Rousseau et al.[44] found promising outcomes, with participants noting decreased symptoms of depression, anxiety, and PTSD; more frequent use of adaptive coping strategies; and an increased sense of connection.

Purpose of the Present Study

There has been increased attention to the value of yoga and mindfulness in addressing the impact of trauma and supporting well-being.[11] We believe that a strength-based intervention can improve well-being and build resilience, including the capacity for growth in the context of trauma experience. We root our conceptualization of resilience in the Resilience Portfolio Model.[45,46] The model defines strengths in three key dimensions: (1) interpersonal resources (compassion, forgiveness); (2) regulatory skills (emotional awareness, emotional regulation, coping, anger management, anxiety management); and (3) meaning-making strengths (spirituality, posttraumatic growth). A polystrength model recognizes the effect of protective factors across a range of positive assets and resources in support of coping and ultimately well-being. The model suggests the value of building a toolkit of protective factors, strengths, and positive coping skills, exploring protective factors and processes that promote well-being and mitigate the effect of trauma rather than focusing solely on static individual characteristics.[45,46] Evidence suggests that one's portfolio of strengths may be more predictive of psychological well-being than trauma dosage and that strengths are just as predictive or more predictive of trauma symptoms as trauma dosage.[47,48] We believe that a curriculum supporting strength-based tool acquisition will support well-being and resilience building in carceral settings.

Although outcomes to date are promising, controlled studies validating the benefits of trauma-informed yoga in carceral settings remain limited. In the present study, we examined the value of a trauma-informed yoga and mindfulness curriculum as a tool for well-being in carceral settings through a quasi-experimental design for program evaluation that included both quantitative and qualitative components. The current study used a waitlist control group comparison to examine the potential benefits of a trauma-informed yoga and mindfulness curriculum for people who are incarcerated, assessing whether program participants supported increased mental and physical well-being after 6 weeks.

Methods

Program Implementation

Yoga 4 Change is a nonprofit organization that offers curriculum-based, trauma-informed programming to four target populations: (1) veterans, (2) individuals who are experiencing incarceration, (3) youth, and (4) people living with mental health conditions including substance use disorders. Yoga 4 Change implements curricula that include physical yoga practice, mindfulness, and thematic teachings tailored to the physical and emotional needs of each population served. Founded in 2014 by Kathryn Thomas, Yoga 4 Change has been implemented in more than 100 facilities in the state of Florida. In their carceral programming, Yoga 4 Change aims to provide tools to support well-being and successful societal reintegration.

The current study assessed implementation of Yoga 4 Change's strength-based trauma-informed yoga and mindfulness manualized curriculum within carceral settings. The Yoga 4 Change carceral program followed a standardized 6-week curriculum; each session integrated a specific theme. The curriculum included physical yoga practice, mindfulness meditation, and thematic self-inquiry.

Curriculum sessions were offered one time per week and taught in person in a group setting. The curriculum consisted of six sessions offered over 6 weeks. Participants could repeat participation in programming; the current study examined each participant's initial 6-week session. Sessions were held in a group room or designated common area. All curriculum sessions were 60 minutes, apart from changes made by security staff (session delayed by security staff, individuals being delayed in release to programming, programming ended sooner than 60 minutes, etc.). Verbal cueing for the physical practice was provided by the class instructor, with each week's curriculum theme woven into the physical practice, mindfulness exercise, and self-inquiry prompts. Instructors did not use hands-on assists or adjustments to ensure that implementation was consistent and trauma informed. Although some yoga professionals support intentional, nondirective, and noninvasive touch within a trauma-informed yoga practice, avoiding touching students is often recommended to facilitate the greatest potential safety for most participants.[36] Meditations were scripted and guided by the instructor. According to curriculum guidelines and in support of consistency in implementation, sessions did not include music.

Although the curriculum and practice were rooted in yoga philosophy, programming intentionally did not use Sanskrit language in cuing. The physical practice was invitational and designed to be accessible. Each physical practice followed a standardized class arc. Sessions began with an instructor-guided breathing practice incorporating the designated class theme (10 minutes). Breathwork was followed by a physical yoga practice (mindful movement) that was intentionally trauma informed, addressed the specific population, and incorporated the theme for the specific class session (30–35 minutes). The class concluded with a guided meditation, prompted writing, and reflection guided by the curriculum theme (15–20 minutes). The carceral curriculum was designed to include yoga forms and relevant themes.

Throughout each session, the instructor introduced one of six themes:

1. gratitude,
2. self-acceptance,
3. peer pressure,
4. expectations,
5. forgiveness, and
6. vulnerability.

Themes were defined and incorporated throughout the session in the meditations, the physical practice, and through discussion and journaling. All themes and topics were addressed using real-world examples and language. The curriculum offered participants concrete tools (breathing practices, movement, journaling) that can be used to manage stress and support overall well-being.

The curriculum was offered by trained Yoga 4 Change instructors. Yoga 4 Change instructors are yoga teachers (minimum 200-hour Registered Yoga Teachers with Yoga Alliance) who additionally received trauma-informed, population-specific, and curriculum-specific training from Yoga 4 Change. The teaching team was led by the Yoga 4 Change founder and executive director, who also taught in the study. Aside from session adjustments resulting from security intervention, no changes to the curriculum protocol were made during the study. Whenever possible, when classes were shortened by security staff, instructors would modify the curriculum session to adhere to the class arc and include all curriculum components.

Curriculum instructors were routinely observed by the executive director or program director to ensure curriculum implementation and protocol fidelity. Each teacher was observed at a minimum twice per 6-week curriculum period. Notes were always taken during observation sessions. Feedback was given primarily postclass, and discussion took place between observer and teacher to ensure understanding. Occasionally, when appropriate, feedback was given live, as in when the teacher was teaching and a deviation was observed. In such cases, the observer might direct the teacher to adjust teaching or wording in a certain way to realign with curriculum guidelines. Prior to instructing any classes in the study, instructors participated in multiple workshops that reviewed the curriculum, ensured understanding, and provided practice as a group. Time was a factor that sometimes instructors were not able to adjust, with institutional movements being late or not as expected. If an observer was present when the time was affected, the observer and teacher preplanned the shortened class to ensure that curriculum themes and the class arc were taught in the most efficient way.

Participant Recruitment

The study took place between February 1, 2018, and January 31, 2019. Recruitment took place in each facility via institution programming staff, security, administrators, court officials, and Yoga 4 Change staff. Participation in the study was voluntary. Participants were recruited for both control group and curriculum participation; assignment was not randomized. Assignment to program participation was in part related to program availability and curriculum session start date. If a curriculum start date was available, recruited participants would be placed in a curriculum cohort and assigned an instructor. If a program cohort was not available at recruitment, and an individual did wish to complete programming, the individual would complete the control group pre- and posttest and be placed on a waitlist. All interested participants were accepted to the study either directly or first through the waitlist control group. Study participants included both people who were awaiting trial and those serving a sentence. Students could complete the control group assessment at one facility and participate in the curriculum once transferred to a second facility, or they could complete both control group assessment and program participation at the same facility. Not all control group participants went on to participate in the curriculum, although the option to participate was available to them.

Curriculum participants completed at least one round of the Yoga 4 Change curriculum. The waitlist control group consisted of individuals who were awaiting trial or incarcerated and not exposed to Yoga 4 Change classes during the initial assessment period. Control group members had access to programming after completion of the 6-week assessment period. Curriculum participants attended one class per week for 6 weeks total. Curriculum participants completed pre- and postprogram assessments before the first week and after the sixth week of programming. Control group participants completed assessment at a 6-week interval.

The current study represents data collected for the first round of assessment for each participant. Curriculum participants could participate in multiple rounds of programming; these data were not part of the current assessment. Multiple rounds of participation in assessment were excluded to control for the impact of repeated assessment and to prevent skewed data resulting from participants gaining new skills and experience by participating in multiple rounds of programming. Exclusion criteria included noncompletion or participation in one or more Yoga 4 Change yoga classes in the 6 months prior to study entry. Study removal was attributed to an individual being released from a carceral facility or sent to a nonparticipating facility. Researchers did not have access to study participants once released from a facility.

Participation in the assessment protocol was voluntary and anonymous. All study participants were provided a written consent form explaining the study protocol and providing appropriate contact information for the research team. The consent form was also read out loud by Yoga 4 Change staff. To maintain anonymity, verbal consent was obtained from all participants. Pre- and posttest assessment was conducted by Yoga 4 Change staff. Study participants completed a written survey tool at week 1 and at 6 weeks. The survey was completed by curriculum participants and those in the control group. Curriculum participants also completed notecards rating stress and mood and documenting physical measures (blood pressure, heart rate) prior to and after participating in each curriculum session. No incentives were provided to study participants.

Measures

Pre- and postclass data were collected with a standardized notecard handed out to each class participant. Participants measured their blood pressure and heart rate using a handheld

blood pressure machine, supported by instructors. Yoga 4 Change instructors received training on the use of a calibrated manual professional sphygmomanometer and on pulse rate evaluation. Outcomes were recorded on the notecard. Participants were also prompted to record a self-assessment rating of stress and mood using 10-point Likert scales. Yoga 4 Change instructors prompted participants to complete the notecards, explaining the process for rating stress and mood. The class card prompted participants to circle a score of 1 to 10. (Stress ratings ranged from 1 = "no stress" to 10 = "most stress"; mood ratings ranged from 1 = "low mood" to 10 = positive mood.") Higher stress ratings equated to less favorable status, whereas higher mood ratings equated to more favorable status. The single-item stress and mood scales were developed for the current study and were not previously validated. The stress and mood scales were used for ease and time efficiency, as the assessment was administered twice (before and after programming) during each class, and program administrators did not want to put an unnecessary burden on limited class time.

The pre- and postprogram assessments took approximately 10–15 minutes to complete and included demographic questions, as well as validated scales evaluating coping, emotional awareness, emotional regulation, anxiety, anger management, compassion, self-compassion, forgiveness, and posttraumatic growth. Demographic data included age, race, ethnicity, marital status, education, and prior experience with yoga and meditation. Sex was determined by institutional designation. The measure of positive coping was designed for this study and did not represent a validated tool. The scale measured use of multiple positive coping skills (breathing practices, movement, journaling, etc.) pertinent to the Yoga 4 Change curriculum. The scale assessed whether the individual currently used a variety of positive coping strategies (yes/no for each coping skill). The scale score was additive to the number of coping skills used. The Emotional Awareness Scale consists of two items ($\alpha = 0.82$) on a 4-point Likert scale measuring the ability to monitor and identify one's feelings.[49] The Emotional Regulation Scale consists of four items ($\alpha = 0.82$) on a 4-point Likert scale assessing ability to maintain stability and manage distressing feelings.[49] The Generalized Anxiety Disorder Scale consists of seven items ($\alpha = 0.90$) on a 4-point Likert scale assessing level of anxiety over the most recent 2-week period.[50,51] The Anger Management Scale–Brief Trait Version consists of four items ($\alpha = 0.87$) on a 4-point Likert scale measuring the regulatory strength of anger management in all relationships.[49] The Compassion Scale consists of seven items ($\alpha = 0.82$) on a 4-point Likert scale measuring the degree to which a person displays care and concern for others, including motivation to help.[49] The Self-Compassion Scale–SF consists of twelve items ($\alpha = 0.86$) on a 5-point Likert scale measuring the model of self-compassion from Kristen Neff, PhD.[52] The Forgiveness Scale consists of three items ($\alpha = 0.63$) on a 4-point Likert scale assessing cognitive, behavioral, and emotional indices of a wronged person's capacity to move on.[49] The Posttraumatic Growth Scale, adapted from Tedeschi and Calhoun,[53] consists of nine items ($\alpha = 0.90$) on a 4-point Likert scale measuring positive outcomes experienced by those who have undergone adverse or stressful life events.[49]

Six qualitative questions were also included as part of the posttest assessment: (1) "Please list 3 strengths of the Yoga 4 Change program"; (2) "Please identify any opportunities for growth or areas for improvement in the Yoga 4 Change program"; (3) "Have you changed as a result of participation in this program? If yes, please describe how"; (4) "Has this program changed the way you interact with others? If yes, please describe how"; (5) "Have you shared the tools you learned in the program with others (peers, family, friends, others)? If so, please describe"; and (6) "Is there any additional feedback you'd like to share regarding the Yoga 4 Change program? If so, please describe below." All measures in the current study were assessed prior to curriculum initiation and at completion of the 6-week curriculum period. Control group assessment occurred at a matched interval. Paper surveys were distributed by trained Yoga 4 Change staff and completed independently by participants. Surveys were voluntary and anonymous. All study protocols were reviewed and approved by the Institutional Review Board of Boston University.

Study Design and Hypotheses

Descriptive statistics were calculated for demographic characteristics for all study participants. We used *t* tests to compare pre- and postclass outcomes. *t*-Test and multiple regression analyses were conducted to compare pre- and postprogram measures of all program scales (coping, emotional awareness, emotional regulation, anxiety, anger management, compassion, self-compassion, forgiveness, and posttraumatic growth) for program participants and waitlist control participants. Scale measures were assessed at a 6-week interval for both program and control group participants.

Qualitative responses were analyzed and independently coded for themes. Analysis followed a grounded theory approach[54] in which data were coded and analyzed into themes and subthemes iteratively. The first 25 responses to the six open-ended questions were independently reviewed by three coders to create a codebook. Once the codebook was established, two independent coders were assigned to a qualitative question and coded the responses. The third coder, who had not been assigned the qualitative question, indicated discrepancies between coders and made a final decision. Once responses were coded and finalized, thematic analyses of the responses were conducted.

The current study used a control group comparison to examine the potential benefits of a trauma-informed yoga curriculum for people who are incarcerated to assess whether curriculum participants evidenced increased well-being. Outcomes explored changes in physical, mental, and interpersonal well-being across a variety of strength-based assets, including regulatory, interpersonal, and meaning-making strengths. We hypothesized that class participation would increase mood and decrease stress. We hypothesized that class

participation would improve physical health measures of blood pressure and heart rate. Furthermore, we hypothesized that curriculum completion would result in significant improvements in measures of coping, emotional awareness, emotional regulation, anger management, compassion, self-compassion, forgiveness, and posttraumatic growth, as well as significant decreases in the experience of anxiety.

Results

Participants

Participant and control group members consisted of men and women residing in three facilities in northeast Florida: a pretrial detention facility, a medium-security correctional facility, and a treatment-focused correctional facility. The 6-week curriculum was offered in multiple iterations during the study period between February 2018 and January 2019. All study participants, both curriculum participants and control group, were recruited from the general population of the three facilities. Individuals were eligible for inclusion if they were incarcerated at one of the three facilities and had a functional command of the English language as assessed by Yoga 4 Change study instructors.

A pretest assessment was completed by 420 study participants (230 curriculum participants and 188 control group members). Two individuals had missing data related to participant status. Fourteen individuals did not complete the final assessment, attributable to the discontinuation of programming, transfer to a facility that did not offer programming, or release to the community during the study period. The current study included 326 individuals in the final assessment: 164 who completed the curriculum and 162 in the control group comparison. Seventy-eight pre/post assessments were excluded from final analysis due to multiple rounds of assessment. The current study compares each participant's first round of assessment. See Figure 1 for protocol detail.

The current dataset included 326 matched first-round pre- and posttest surveys: 164 for the curriculum group and 162 for the control group. See Table 1 for demographic breakdown. Study participants (curriculum and control) were primarily White (56.4%) and male (63.7%), with a mean age of 33.8 years (SD = 10.1; range 18–69). Of the curriculum participants, 34.8% were People of Color and 65.2% were White; of the control group participants, 53.1% were People of Color and 46.9% were White. Racial distribution was likely influenced by institution type. The educational attainment level of all study participants (curriculum and control) ranged from middle school to doctoral degree, with 48% of study participants reporting high school as the highest level of education they had completed. Most study participants reported their relationship status as single (42.3%). Curriculum participants and control group participants indicated similar levels of experience with yoga (34.6% vs. 30.4%) and meditation (44.2% vs. 52.2%) prior to participation in the study, respectively.

Figure 1. Flow Diagram of Study Design

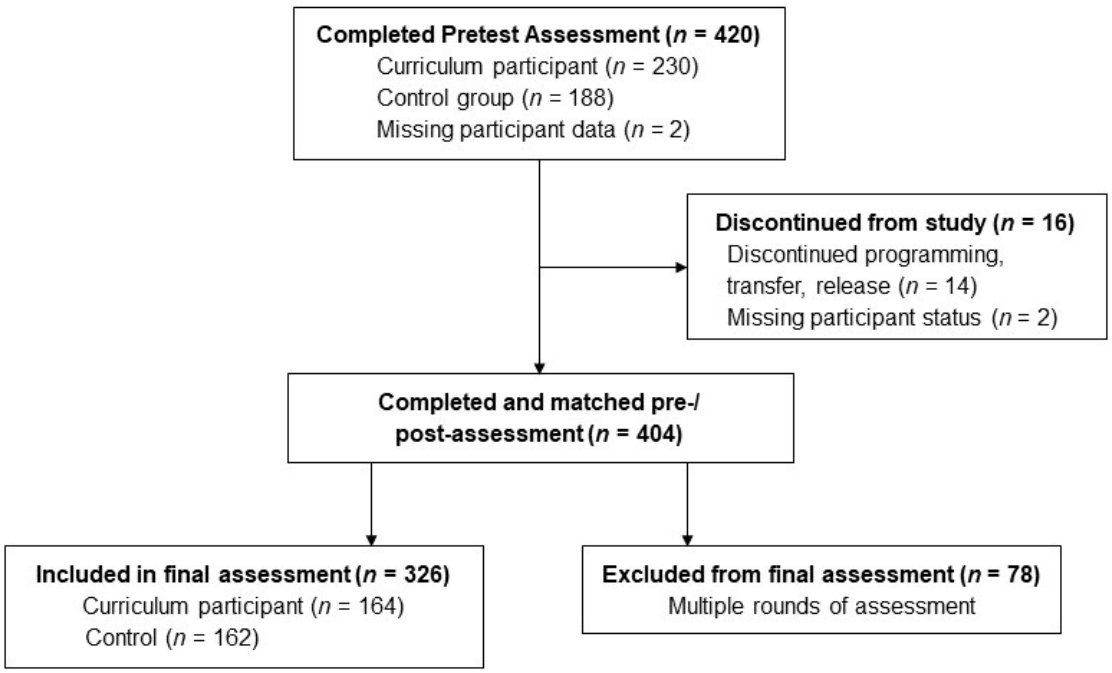

Table 1. Demographic Characteristics

	All Cases (*n* = 326)		Curriculum (*n* = 164)		Control (*n* = 162)	
Characteristic	**% or Mean**	**Range**	**% or Mean**	**Range**	**% or Mean**	**Range**
Sex						
Men	63.7%		61.6%		66.7%	
Women	36.3%		38.4%		33.3%	
Ethnicity						
White	56.4%		65.2%		46.9%	
Person of Color	43.6%		34.8%		53.1%	
Hispanic	7.3%		7.8%		7.0%	
Age (y)	33.8	18–69	34.9	19–69	32.7	18–61
Education						
Middle school	9.7%		12.8%		6.8%	
High school	48.0%		36.5%		59.6%	
Some college	27.0%		31.4%		22.4%	
College degree	12.5%		15.4%		9.3%	
Postgraduate	2.8%		3.8%		1.8%	
Relationship status						
Single	42.3%		40.0%		44.4%	
Married	11.7%		12.3%		11.3%	
Dating relationship	17.4%		18.7%		16.3%	
Past practice (yes)						
Yoga	31.7%		34.6%		30.4%	
Meditation	46.6%		44.2%		52.2%	
Facility						
Pretrial detention	46.9%		21.3%		72.8%	
Pre-release treatment	26.2%		41.5%		10.8%	
Medium security	26.9%		37.2%		16.5%	

For institutional affiliation, 46.9% of all the study participants participated at the pretrial detention facility, 26.2% at the prerelease treatment-focused correctional facility, and 26.9% at the medium-security correctional facility. Regarding the distribution of curriculum participation among facilities, 21.3% of program participants were located within the pretrial detention facility, 41.5% in the prerelease treatment facility, and 37.2% in the medium-security correctional facility; 72.8% of the control group participants were incarcerated at the pretrial detention facility, 10.8% at the prerelease treatment facility, and 16.5% at the medium-security correctional facility. The pretrial detention facility was the first point of contact for most study participants. This, in part, explains the high number of control group participants at pretrial facilities. Many participants completed the control group assessment period while in pretrial detention and were then able to join the curriculum group when moved to a sentenced facility. The fewest control group participants were recruited at the prerelease treatment facility, as these individuals were the closest to release to the community.

Pre-/Postclass Outcomes

Paired-sample *t* tests were conducted on participants to examine whether there was a significant difference for each scale prior to and after class (Table 2). Before and after every class, self-reported data were collected from each participant to observe physical and mental health changes in real time. For the duration of the study (February 2018–January 2019), there was a significant increase in mood (30%) and a significant decrease in stress (41%) after participation in class as compared to before class. Systolic and diastolic blood pressure measurements trended downward and showed statistical significance but did not reach clinically meaningful reductions. To determine whether there were differences in physical and mental health changes based on sex, additional *t* test analyses were conducted for women and men separately (Table 2). For women, there was a significant increase in mood (27%) and a significant decrease in stress (34%) after participation in class as compared to before class. For heart rate, there was a statistically significant decrease (4.8%) in women. For men, there was a significant increase in mood (31%) and a significant decrease in stress (46%) after participation in class as compared to before class. Additionally, there were statistically significant decreases in blood pressure (1.0% systolic) and (2.3% diastolic) for men. For heart rate, there was a statistically significant increase (7.4%) in men.

Pre-/Postcurriculum Outcomes

Paired-sample *t* tests were conducted on both the control group participants and the curriculum participants to test for significant differences in mean scale scores at week 1 compared to week 6 (Table 3). Significant changes were found in the control group for anxiety (11.58% decrease) and coping (5.95% increase). Significant findings for the curriculum participation group were found for coping (32.92% increase), emotional regulation (13.04% increase), anxiety (21.74% decrease), self-compassion (6.12% increase), forgiveness (6.73% increase), and posttraumatic growth (8.96% increase).

Difference-in-difference models were conducted using multiple regression analysis to control for baseline differences between the control and curriculum participation groups. Significant findings indicated improvement in scale scores for curriculum participants not experienced by the control group. Several variables in the multivariate analyses (emotional regulation, self-compassion, anxiety) no longer remained significant after controlling for baseline differences and comparison to the control group. Three variables did still show significant change over and above comparison to the control group. Curriculum participation significantly predicted positive change in use of coping skills ($\beta = 1.23$, $p < 0.001$), forgiveness ($\beta = 0.61$, $p = 0.040$), and posttraumatic growth ($\beta = 1.69$, $p = 0.045$). After curriculum participation, participants were more likely to employ positive coping skills, experienced greater levels of forgiveness, and were more likely to experience posttraumatic growth as compared to the control group members who did not participate in programming.

Qualitative Data

Psychological and Physical Health

The findings from the qualitative data indicate that most participants perceived benefit from the program. In response to an open-ended question on whether the Yoga 4 Change had significantly impacted them, most participants mentioned improvements in their well-being and positive affect, including experiencing improved mood. Namely, participants described feeling calmer, more at peace, or more relaxed because of their participation in the program. Most participants also noted an improvement in some aspect of their physical health or well-being, such as increased strength, greater flexibility, improved quality of sleep, or decreased pain. This finding is illustrated by a 29-year-old female participant who stated, "I've learned to focus my thoughts at night, and Yoga 4 Change has helped me get to sleep."

Table 2. Pre-/Postclass Comparison of Means

	All Participants				Women Participants				Men Participants			
Scale	**Pre**	**Post**	***t***	***p***	**Pre**	**Post**	***t***	***p***	**Pre**	**Post**	***t***	***p***
Mood	6.33***	8.20	–45.22	0.000	6.25***	7.94	–26.54	0.000	6.38***	8.37	–36.77	0.000
Stress	5.14***	3.04	45.11	0.000	5.48***	3.61	26.31	0.000	4.92***	2.66	36.86	0.000
Systolic blood pressure	116.51*	115.46	2.49	0.013	111.59	110.87	1.04	0.300	119.44*	118.19	2.35	0.019
Diastolic blood pressure	76.90***	75.50	4.20	0.000	74.10	73.46	1.16	0.245	78.56***	76.72	4.44	0.000
Heart rate	73.89***	76.02	–6.41	0.000	76.30***	72.65	6.66	0.000	72.54***	77.89	–13.62	0.000

*$p < 0.05$.
***$p < 0.001$.

Table 3. Pre-/Postcurriculum Comparison of Means with Difference-in-Difference Analyses

	Control				Treatment (Curriculum Participants)				Between Groups	
Scale	**Pre**	**Post**	***t***	***p***	**Pre**	**Post**	***t***	***p***	**β**	***p***
Coping	4.87	5.16*	2.31	0.02	4.80	6.38***	11.91	< 0.001	1.23	< 0.001***
Emotional awareness	7.17	7.30	1.48	0.14	6.90	7.04	1.23	0.220	0.00	0.990
Emotional regulation	10.15	10.41	1.10	0.27	9.28	10.49***	4.99	< 0.001	1.02	0.056
Anxiety	9.15	8.09**	–2.58	0.01	9.66	7.56***	–4.69	< 0.001	–1.06	0.270
Anger management	16.75	16.81	0.30	0.77	16.23	16.58	1.48	0.140	0.25	0.630
Compassion	25.15	24.89	–1.14	0.26	24.77	24.85	0.34	0.740	0.24	0.650
Self-compassion	37.13	37.60	0.81	0.42	34.63	36.75***	3.48	< 0.001	1.49	0.290
Forgiveness	10.33	10.38	0.30	0.76	10.10	10.78***	3.82	< 0.001	0.61	0.040*
Posttraumatic growth	30.55	31.21	1.93	0.55	29.03	31.63***	6.27	< 0.000	1.69	0.045*

*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

Several participants also described Yoga 4 Change as one of few opportunities for physical activity given the carceral setting, illustrated by a male participant who noted, "Movement helps with inmates because we don't move around or stretch much." This benefit seemed heightened for participants who experienced chronic pain; for instance, a 51-year-old Black male participant noted that movement "helped improve [their] hurt leg," and another male participant explained it "helps [him] work out body parts that hurt."

Strength-Based Coping

Most participants mentioned increased use of adaptive coping responses. Some participants cited regulatory tools learned from the program aiding in coping with feelings of anxiousness or anger. For example, a White male participant noted, "It has helped me deal with my anger by helping me to relieve stress in a more positive way." Similarly, another White male participant stated, "I've learnt to calm myself mentally and physically and to really dig deep and see what's eating away at my learning to let go."

Improved focus and self-control were additional perceived changes in regulatory strengths mentioned by several participants. Yoga 4 Change guided participants through meditation, breathing techniques, and yoga forms that some reported using to promote well-being in response to stress experienced while incarcerated. For example, one White female participant mentioned using breathing techniques as a coping behavior, which they said "really helped me during disappointments I've had here."

Interpersonal strengths were frequently described by participants. Several participants mentioned feeling better able to understand and communicate with others because of participating in programming. When asked about ways in which their participation in Yoga 4 Change impacted their behavior, several participants described the program's effect on their social interactions. Some noted being more open, able, and motivated to socialize with peers. This change allowed some to become more vocal in group settings, such as a 34-year-old White female participant who expressed, "I feel able to talk to the group and enjoy open discussions."

Yoga and mindfulness techniques were cited to play a direct role in interpersonal strengths for some, such as a 31-year-old White male participant who explained, "By calming myself and finding my center I have more patience dealing with others." Others felt their participation led to their listening more attentively, interacting more authentically, or "communicating [their] feelings with other[s] without fear of judgment."

In responding to an open-ended question on strengths of the program, participants mentioned resources such as the availability of supportive relationships. Their participation in Yoga 4 Change enabled them the opportunity to form bonds with both "friendly teachers with a passion for the program" and with peers. Participants described a "sense of comradery," aiding them in "creating a sense of belonging, establishing relationships, creating comfort and understanding of oneself," as one 29-year-old Latino male participant affirmed. Additionally, participants reported sharing yoga postures, breathing techniques, meditations, relaxation techniques, tools promoting positive thinking, and tools for sleep with peers and family members. As a 36-year-old White participant in the jail facility recalled, "I try to help other inmates to breathe through the rough spots, and we do yoga in our exercise portions of each day in the dorms." A 29-year-old female shared, "I show several girls in the dorm poses and we do a body scan in my room at night before going to sleep." A 29-year-old male stated, "I have shared everything I could[,] from discussions to moves[,] with anybody that would listen."

Qualitative feedback also suggested support of increased meaning making, even within the carceral setting. Self-awareness, open-mindedness, acceptance, self-acceptance, and optimism were mentioned areas of perceived improvement. For example, one White male participant expressed their hope and acceptance of humanity gained by participating in the program, stating, "It has given me a more positive perspective on life and human beings in general. We are all just people. Flawed and beautiful people." For others, participating in programming was described as providing an outlet for spiritual well-being or a perspective of a "mind, body, spirit" connection.

Resources and Recommendations

Participants described their perceived personal development of assets and supportive relationships despite living in a resource-limited setting. The prison environment was highlighted as a weakness by several participants in their responses to an open-ended question on areas for improvement. Some participants pointed out the need for a "bigger, quieter place" to practice yoga, whereas others simply desired "more peaceful" conditions. Nevertheless, amid the stress of a carceral setting, Yoga 4 Change was described by many as a safe refuge, allowing them to be "vulnerable to express [their] personal feelings."

In addition to the benefits of participating in yoga classes, some participants had specific recommendations to improve programming. These suggestions included making classes longer or more frequent or making classes available to more individuals, as illustrated by one participant who stated, "More classes weekly. One isn't enough." A few participants also made recommendations to make the environment more calming, including playing soft music. For example, one participant requested playing sounds of "wind or water."

Discussion

Pre- and postclass outcomes indicated a demonstrable effect, with class participation improving mood and decreasing ratings of stress. Participation in class resulted in a statistically significant but marginally clinically meaningful decrease in blood pressure. Yoga has been well-documented to aid in optimized cardiovascular outcomes over time, and a longer study period could result in more meaningful effects.[55–57]

Multivariate analyses indicated improvement for curriculum participants in a variety of areas, including positive coping, emotional regulation, self-compassion, forgiveness, and posttraumatic growth, as well as decreased experience of anxiety. When compared specifically to the experience of control group participants, the most significant changes for curriculum participants were found in implementation of positive coping, forgiveness, and posttraumatic growth. In controlling for facility type, sex, age, race, and pretest scale score, those who participated in the Yoga 4 Change curriculum demonstrated significant increases in the use of adaptive coping behaviors, forgiveness, and posttraumatic growth, as compared to equivalent control group members.

Yoga programming appears to constitute a viable strengths-based method for enhancing individuals' well-being. Through a strength-based approach, the Yoga 4 Change curriculum was designed to support positive coping, well-being, and resilience building. The curriculum aligns with the Resilience Portfolio Model[45,46] and aims to support resilience across key positive assets, including regulatory skills, interpersonal connection, and meaning making. According to this model, regulatory strengths help people to manage behavior and emotions. Interpersonal strengths include skills used to navigate the social ecology. Meaning making refers to connection to something larger than oneself.[45] The Yoga 4 Change curriculum incorporates many elements in support of strength-based resilience building.

Although a significant difference between the curriculum participant and control groups was found for only a portion of the measures examined, there was evidence of resilience building for program participants. Promotion of regulatory strengths can be seen in improved positive coping and regulation of emotion. One of the strongest findings, that of increased forgiveness, suggests strengthened interpersonal capacity. The lack of positive change in other interpersonal measures, such as compassion, is perhaps not surprising considering that other studies have found little impact or outcomes in a direction opposite of that expected.[48,58] Qualitative findings did suggest connection through improvements in interpersonal resources and participants' desire to share programming with others. The experience of posttraumatic growth by curriculum participants within an environment as stressful and trauma-inducing as the carceral setting is particularly noteworthy and indicative of increased capacity for meaning making. Overall, findings suggest the potential for a trauma-informed yoga and mindfulness curriculum to support resilience building in carceral settings as conceptualized in the Resilience Portfolio Model.[45,46]

Limitations

The present study has several limitations. Of note, the assignment to treatment versus control group lacked randomization, limiting capacity to determine cause and effect. Selection bias could result in nonequivalence between study groups, although the impact of selection bias is mediated by the waitlist design. There were differences in the control and curriculum participating groups by race and facility type. Individual differences may cause the participant group to be nonrepresentative of the general population of incarcerated individuals; however, diversity of the participant and control groups may negate individual differences.

Data in the study were self-reported and could reflect social desirability bias. Additionally, not all of the measures used were validated. The pre- and postsession measures of stress and mood were single-item measures created for the study to support ease of curriculum implementation and minimize impact on program sessions. Although such a decision benefited programming, it limited data validity. The measure of positive coping skills was also created for this program to assess curriculum-specific components and was not validated. Both quantitative and qualitative outcomes suggest decreased stress, improved mood, and increased use of positive coping tools; however, outcomes should be taken with caution and further research is warranted. Clinical interpretations of blood pressure outcomes should be interpreted with caution.

Additionally, all participating facilities were in northeast Florida, potentially limiting generalizability to facilities outside of the area. Outcomes suggest the potential benefit of assessing curriculum impact in other regions. Finally, the current study lacks long-term outcomes. Future research would benefit from participant follow-up.

Additional challenges in the project were related to working within a carceral environment and coordinating with correctional staff. Challenges including canceled classes, participants not being called to class or being withdrawn from class, as well as threats to assessment protocol. Despite limitations, this study demonstrates that a trauma-informed yoga curriculum could play a significant role in increasing mental, physical, and emotional well-being and promote resilience within incarcerated populations.

Although the findings of this study are promising, continued research is needed to further explore the impacts of trauma-informed yoga programming in carceral settings. Additional controlled studies with randomized assignment are encouraged to strengthen the validity of outcomes. Future research should also expand the diversity of participants and settings, as the current project was limited to northeast Florida. It will be valuable to assess the generalizability of findings across geographical regions, facility types, and populations. Furthermore, follow-up interviews and assessments postrelease from correctional facilities would provide insight into any sustained effects on reentry and recidivism. Qualitative data highlight the meaningfulness of relationships formed; future work could explore relationship building as a mechanism of change. Finally, conducting cost-benefit analyses would help to further demonstrate the value of trauma-informed yoga curricula in carceral settings and support broader implementation. Overall, controlled trials using mixed methods are recommended to substantiate the current findings regarding the benefit of trauma-informed yoga in building strengths and promoting well-being for incarcerated individuals.

Conclusions

The present work suggests a promising area for future programming, offering a low-cost strategy to promote well-being and resilience building for people who are incarcerated. Skill building and resources were supported across key theoretical assets of resilience, including regulatory strengths, interpersonal strengths, and meaning making. Program participants experienced improved mood and decreased stress, access to strength-based coping strategies, increased experience of forgiveness, and posttraumatic growth. Both qualitative and quantitative outcomes suggest the value of a trauma-informed yoga and mindfulness curriculum in supporting people who are incarcerated through promoting strengths that include aspects of regulation, interpersonal connection, and meaning making. Outcomes are encouraging and suggest the value of continued program implementation and evaluation. Further evaluation should continue to explore strength-based and trauma-informed carceral programming.

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Conflict-of-Interest Statement

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References

1. Conner C, Mitchell C, Jahn J. Advancing public health interventions to address the harms of the carceral system: A policy statement adopted by the American Public Health Association, October 2021. *Med Care.* 2022;60(9): 645–647.
2. Mauer M. Incarceration rates in an international perspective. Oxford Research Encyclopedia of Criminology. Published April 26, 2017. Accessed Feb. 22, 2023. https://oxfordre.com/criminology/view/10.1093/acrefore/9780190264079.001.0001/acrefore-9780190264079-e-233
3. Massoglia M, Pridemore WA. Incarceration and health. *Ann Rev Sociol.* 2015;41(1):291–310. doi:10.1146/annurev-soc-073014-112326
4. Wang EA, Redmond N, Dennison Himmelfarb CR, et al. Cardiovascular disease in incarcerated populations. *J Am Coll Cardiol.* 2017;69(24):2967–2976. doi:10.1016/j.jacc.2017.04.040
5. Bronson J, Berzofsky M. Special report: Indicators of mental health problems reported by prisoners and jail inmates, 2011-12. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Published June 2017. Accessed Feb. 22, 2023. https://bjs.ojp.gov/content/pub/pdf/imhprpji1112.pdf
6. Celinska K, Fanarraga I. Female prisoners, mental health, and contact with family and friends. *Prison J.* 2022;102(3):259–282. doi:10.1177/00328855221095518
7. Constantino P, Assis SG, Pinto LW. The impact of prisons on the mental health of prisoners in the state of Rio de Janeiro, Brazil. *Ciência & Saúde Coletiva.* 2016;21(7):2089–2100. doi:10.1590/1413-81232015217.01222016
8. Human Impact Partners. From crisis to care: Ending the health harm of women's prisons. Feb. 2023. https://humanimpact.org/wp-content/uploads/2023/02/HIP-From-Crisis-to-Care-02-2023.pdf
9. Macy RJ, Jones E, Graham LM, Roach L. Yoga for trauma and related mental health problems: A meta-review with clinical and service recommendations. *Trauma Violence Abuse.* 2018;19(1):35–57. doi:10.1177/1524838015620834
10. Nguyen-Feng VN, Clark CJ, Butler ME. Yoga as an intervention for psychological symptoms following trauma: A systematic review and quantitative synthesis. *Psychol Serv.* 2019;16(3):513–523. doi:10.1037/ser0000191
11. van der Kolk BA. *The body keeps the score: Brain, mind, and body in the healing of trauma.* Viking; 2014.
12. Guendelman S, Medeiros S, Rampes H. Mindfulness and emotion regulation: Insights from neurobiological, psychological, and clinical studies. *Front Psychol.* 2017;8:220. doi:10.3389/fpsyg.2017.00220
13. Chiesa A, Serretti A, Jakobsen JC. Mindfulness: Top-down or bottom-up emotion regulation strategy? *Clin Psychol Rev.* 2013;33(1):82–96. doi:10.1016/j.cpr.2012.10.006
14. Büssing A, Michalsen A, Khalsa SB, Telles S, Sherman KJ. Effects of yoga on mental and physical health: A short summary of reviews. *Evid Based Complement Alternat Med.* 2012;2012:165410. doi:10.1155/2012/165410
15. Cramer H, Lauche R, Langhorst J, Dobos G. Yoga for depression: A systematic review and meta-analysis. *Depression Anxiety.* 2013;30(11):1068–1083. doi:10.1002/da.22166
16. Smith C, Hancock H, Blake-Mortimer J, Eckert K. A randomized comparative trial of yoga and relaxation to reduce stress and anxiety. *Complement Ther Med.* 2007;15(2):77–83. doi:10.1016/j.ctim.2006.05.001
17. van der Kolk BA, Stone L, West J, et al. Yoga as an adjunctive treatment for posttraumatic stress disorder: A randomized controlled trial. *J Clin Psychiatry.* 2014;75(6):e559–e565. doi:10.4088/JCP.13m08561
18. Baer RA. Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clin Psychol: Sci Pract.* 2003;10(2):125–143. doi:10.1093/clipsy.bpg015
19. Park CL, Slattery JM. Yoga as an integrative therapy for mental health concerns: An overview of current research evidence. *Psychiatry Int.* 2021; 2(4):386–401. doi:10.3390/psychiatryint2040030
20. Carmody J, Baer RA. Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a Mindfulness-Based Stress Reduction program. *J Behav Med.* 2007;31(1):23–33. doi:10.1007/s10865-007-9130-7
21. Impett EA, Daubenmier JJ, Hirschman AL. Minding the body: Yoga, embodiment, and well-being. *Sex Res Social Policy.* 2006;3(4):39–48. doi:10.1525/srsp.2006.3.4.39
22. Mitchell KS, Dick AM, DiMartino DM, et al. A pilot study of a randomized controlled trial of yoga as an intervention for PTSD symptoms in women. *J Trauma Stress.* 2014;27(2):121–128. doi:10.1002/jts.21903
23. Rhodes AM. Claiming peaceful embodiment through yoga in the aftermath of trauma. *Complement Ther Clin Pract.* 2015;21(4):247–256. doi:10.1016/j.ctcp.2015.09.004
24. Price M, Turner J, Emerson D. Effectiveness of an extended yoga treatment for women with chronic posttraumatic stress disorder. *J Altern Complement Med.* 2017;23(4):300–309.doi:10.1089/acm.2015.0266
25. Auty KM, Cope A, Liebling A. A systematic review and meta-analysis of yoga and mindfulness meditation in prison. *Int J Offender Ther Comp Criminol.* 2015;61(6):689–710. doi:10.1177/0306624x15602514
26. Bilderbeck AC, Farias M, Brazil IA, Jakobowitz S, Wikholm C. Participation in a 10-week course of yoga improves behavioural control and decreases psychological distress in a prison population. *J Psychiatric Res.* 2013; 47(10):1438–1445. doi:10.1016/j.jpsychires.2013.06.014
27. Duncombe E, Komorosky D, Kim EW, Turner W. Free inside: A program to help inmates cope with life in prison at Maui Community Correctional Center. *Calif J Health Promot.* 2005;3(4):48–58. doi:10.32398/cjhp.v3i4.1781

28. Epstein R, Gonzalez T. Gender and trauma: Somatic interventions for girls in juvenile justice: Implications for policy and practice. Center on Poverty and Inequality. Published2017. Accessed Feb.22, 2023. https://genderjusticeandopportunity.georgetown.edu/wp-content/uploads/2020/06/gender-and-trauma-1.pdf
29. Elger BS, Sekera E. Prospective evaluation of insomnia in prison using the Pittsburgh Sleep Quality Index: Which are the factors predicting insomnia? *Int J Psychiatry Clin Pract.* 2009;13(3):206–217. doi:10.1080/13651500902812043
30. Sheppard N, Hogan L. Prevalence of insomnia and poor sleep quality in the prison population: A systematic review. *J Sleep Res.* 2022;31(6):e13677. doi:10.1111/jsr.13677
31. Waters MJ. Yoga in correctional settings: A review of the literature. Published 2022. Retrieved from the University of Minnesota Digital Conservancy July 31, 2023. https://hdl.handle.net/11299/243311
32. Wimberly AS, Xue J. A systematic review of yoga interventions in the incarcerated setting. *J Sociol Soc Welf.* 2016;43. doi:10.15453/0191-5096.4046
33. Himelstein S. Meditation research: The state of the art in correctional settings. *Int J Offender Ther Comp Criminol.* 2011;55(4):646–661. doi:10.1177/0306624x10364485
34. Landau PS, John Gross JB. Low reincarceration rate associated with Ananda Marga yoga and meditation. *Int J Yoga Therap.* 2008;18(1):43–48. doi:10.17761/ijyt.18.1.a41504h5w240v3u4
35. U.S. Substance Abuse sand Mental Health Services Administration, National Mental Health and Substance Use Policy Laboratory. *Practical guide for implementing a trauma-informed approach.* SAMHSA publication No. PEP23-06-05-005. Substance Abuse and Mental Health Services Administration; 2023.
36. Rousseau D. *Yoga and resilience: Empowering practices for survivors of sexual trauma.* Handspring Publishing; 2020.
37. West J, Liang B, Spinazzola J. Trauma sensitive yoga as a complementary treatment for posttraumatic stress disorder: A qualitative descriptive analysis. *Int J Stress Manag.* 2017;24(2):173–195. doi:10.1037/str0000040
38. Darroch FE, Roett C, Varcoe C, Oliffe JL, Gonzalez Montaner G. Trauma-informed approaches to physical activity: A scoping study. *Complement Ther Clin Pract.* 2020;41:101224. doi:10.1016/j.ctcp.2020.101224
39. Horton C, ed. *Best practices for yoga in the criminal justice system.* YSC-Omega Publications; 2017.
40. Zepeda Méndez M, Nijdam MJ, ter Heide FJ, van der Aa N, Olff M. A five-day inpatient EMDR treatment programme for PTSD: Pilot study. *Eur J Psychotraumatol.* 2018;9(1). doi:10.1080/20008198.2018.1425575
41. Tibbitts DC, Aicher SA, Sugg J, et al. Program evaluation of trauma-informed yoga for vulnerable populations. *Eval Program Plann.* 2021;88:101946. doi:10.1016/j.evalprogplan.2021.101946
42. Braun TD, Uebelacker LA, Ward M, Holzhauer CG, McCallister K, Abrantes A. "We really need this": Trauma-informed yoga for veteran women with a history of military sexual trauma. *Complement Ther Med.* 2021;59:102729. doi:10.1016/j.ctim.2021.102729
43. Danielly Y, Silverthorne C. Psychological benefits of yoga for female inmates. *Int J Yoga Therap.* 2017;27(1):9–14. doi:10.17761/ijyt2017_research_danielly_epub
44. Rousseau D, Long N, Jackson E, Jurgensen J. Empowering through embodied awareness: Evaluation of a peer-facilitated trauma-informed mindfulness curriculum in a woman's prison. *Prison J.* 2019;99(suppl. 4). doi:10.1177/0032885519860546
45. Grych J, Hamby S, Banyard V. The resilience portfolio model: Understanding healthy adaptation in victims of violence. *Psychol Violence.* 2015;5(4):343–354. doi:10.1037/a0039671
46. Banyard VL, Hamby SL. *Strengths-based prevention: Reducing violence and other public health problems.* American Psychological Association; 2021.
47. Hamby S, Taylor E, Mitchell K, Jones L, Newlin C. Health-related quality of life among adolescents as a function of victimization, other adversities, and strengths. *J Ped Nurs.* 2020;50:46–53.
48. Brooks M, Taylor E, Hamby S. Polyvictimization, polystrengths, and their contribution to subjective well-being and posttraumatic growth. *Psychol Trauma.* Published online May 4, 2023. doi:10.1037/tra0001489
49. Hamby S, Grych J, Banyard V. Life paths measurement packet: Finalized scales. Published 2015. Accessed Feb.23, 2023. https://lifepathsresearch.org/wp-content/uploads/2021/10/Life-Paths-Measurement-Packet-finalized-scales-Aug-2015-Color-front-and-back.pdf
50. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder. *Arch Intern Med.* 2006;166(10):1092. doi:10.1001/archinte.166.10.1092
51. Dhira TA, Rahman MA, Sarker AR, Mehareen J. Validity and reliability of the Generalized Anxiety Disorder-7 (GAD-7) among university students of Bangladesh. *PLoS One.* 2021;16(12):e0261590. doi:10.1371/journal.pone.0261590
52. Raes F, Pommier E, Neff KD, Van Gucht D. Construction, and factorial validation of a short form of the self-compassion scale. *Clin Psychol Psychother.* 2010;18(3):250–255. doi:10.1002/cpp.702
53. Tedeschi RG, Calhoun LG. The posttraumatic growth inventory: Measuring the positive legacy of trauma. *J Trauma Stress.* 1996;9(3):455–471. doi:10.1002/jts.2490090305
54. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3:77–101. doi:10.1191/1478088706qp063oa
55. Bruce C, Achan V, Rathore S. Yoga-based cardiac rehabilitation: Current perspectives from randomized controlled trials in coronary artery disease. *Vasc Health Risk Manag.* 2021;17:779–789. doi:10.2147/VHRM.S286928
56. Anderson L, Oldridge N, Thompson DR, et al. Exercise-based cardiac rehabilitation for coronary heart disease: Cochrane systematic review and meta-analysis. *J Am Coll Cardiol.* 2016;67(1):1–12. doi:10.1016/j.jacc.2015.10.044
57. Haider T, Sharma M, Branscum P. Yoga as an alternative and complimentary therapy for cardiovascular disease: A systematic review. *J Evid Based Complementary Altern Med.* 2017;22(2):310–316. doi:10.1177/2156587215627390
58. Hamby S, Taylor E, Mitchell K, Jones L, Newlin C. Poly-victimization, trauma, and resilience: Exploring strengths that promote thriving after adversity. *J Trauma Dissociation.* 2020;21(3):376–395. doi:10.1080/15299732.2020.1719261