

Yoga-based Psychotherapy Groups for Boys Exposed to Trauma in Urban Settings

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ABSTRACT

Background • Children who experience abuse and neglect and are exposed to adverse life events are at risk of developing emotional and behavioral problems. They may display variable internalizing and externalizing symptoms, such as posttraumatic stress, depression, anxiety, low self-esteem, and aggression. Yoga may be able to regulate body-brain pathways that cause stress following traumatic experiences, thereby reducing adverse mental and physical sequelae.

Objective • The objective of this preliminary study is to examine changes in functioning following meetings of a yoga-based psychotherapy group (YBPG) for boys with a history of interpersonal trauma exposure.

Methods/Design • The study was a prospective, intervention cohort study.

Setting • The study occurred at an urban-based mental health center focusing on treatment of children exposed to interpersonal trauma in their communities and families.

Participants • Participants were 10 boys, aged 8-12 y, who primarily were African-Americans (70%) and who had a history of trauma.

Intervention • The YBPG was a 12-wk, yoga-based, group therapy, integrated with mental health treatment that was trauma informed and evidence-based.

Outcome Measures • Measures of attendance and interpersonal functioning—the Behavioral and Emotional Rating Scale 2 (BERS-2) and patient satisfaction surveys—were collected. The pre- and post-YBPG, paired *t* test; Wilcoxon's signed rank test; and effect sizes were calculated to assess change in interpersonal functioning following the YBPG, as reported by the parents and children.

Results • The BERS-2 scores yielded clinically and statistically significant mean improvements on the parents' ratings of participants' (1) Interpersonal Strength, Intrapersonal Strength, and Family Involvement scores, with mean improvements on those subscales being 1.4 ($P = .007$), 1.9 ($P = .012$), and 1.4 ($P = .045$) points, respectively; and (2) Strength Index scores, with a mean improvement of 8.7 ($P = .004$). The effect size was in the large range. In addition to significant improvements posttreatment, the parents' mean rating score of their children's functioning was closer but still lower than the children's self-reports on all subscales. The attendance rate for the YBPG was among the highest for group therapies at the center.

Conclusions • The study provided preliminary evidence for the feasibility of YBPG as an effective intervention for boys exposed to trauma in urban settings. (*Altern Ther Health Med.* 2016;22(1):39-46.)

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Childhood abuse and neglect occurred to more than 679 000 children in the United States in 2013.¹ Child maltreatment (eg, physical abuse, sexual abuse, emotional abuse, or neglect) as well as adverse childhood experiences (eg, poverty, community violence, and living in a household where parental substance abuse, mental illness,

and/or a history of parental incarceration exists), collectively called *child trauma*, are known to have long-term negative effects on children. Those effects often last into adulthood. A recent study conducted in the state of Maryland, where the current study took place, revealed more than 12 000 children were victims of trauma in 2013.¹

Yoga is recognized as a form of mind-body medicine. It is a “primarily self-oriented, promotive science, which further integrates development of the psychophysical and emotional aspects of an individual.”² Yoga practice promotes the unity of mind and body. If the mind is relaxed, the body’s muscles will also be relaxed, opposing the effects of the exposure to chronic stress and trauma. Yoga is practiced by growing numbers of people in the United States³ and has demonstrated positive effects on the functioning of adults and children.⁴⁻⁶ Therapeutic yoga interventions have demonstrated effectiveness in children and adolescents who exhibit symptoms of inattention, anxiety, depression, substance abuse, and eating disorders, in both academic and treatment settings.⁴

Trauma in Urban Youth

It is well documented that children who are exposed to trauma in childhood are at risk for developing emotional and behavioral problems, including dysregulation, posttraumatic stress, depression, low self-esteem, and aggression.⁷⁻⁹ Children and adolescents living in low-income urban communities are often exposed to high levels of traumatic experiences, increasing their risk of developing traumatic stress disorders.¹⁰ In a study of urban youth who had been exposed to trauma, 16% of the trauma victims met the criteria for posttraumatic stress disorder (PTSD).⁸ Mendelson and colleagues have posited that children exposed to chronic trauma and stress have difficulties in regulating thoughts and emotions.⁵ Other research has indicated that the exposure to environmental stress is a key contributor to the presence of internalizing and externalizing disorders in youth.¹¹

Gender and Trauma

Some research demonstrated that gender, age, and race affect the expression of psychological distress, especially with respect to symptoms of depression and anxiety.¹² Role socialization based on gender may place urban minority youth, particularly boys, at higher risk for several negative, behavioral, and mental health outcomes, including interpersonal aggression, substance use, and delinquency. Studies of urban youth exposed to negative life events have demonstrated their higher vulnerability to psychological distress.^{11,13} In addition, at-risk urban youth may be less likely to be identified due to their restricted ability to express anxiety and fear.¹⁴ Urban minority youths tend to hide emotional distress for fear of being seen as weak, which leads to their adoption of an aggressive identity to pass unwanted feelings onto others and to shield themselves from psychological pain.¹⁴ The tendency to engage in a physical expression of emotions, as an externalizing strategy for coping, supports the premise that a physically based, gender-

specific treatment program, such as yoga, may be an effective adjunct to trauma-informed mental health treatment.

Yoga as an Adjunct Therapy

Yoga focuses on individual strengths and can improve a child’s feelings of well-being.¹⁵ A 12-week, randomized trial of yoga and mindfulness, which were practiced by fourth- and fifth-grade students living in an urban setting, resulted in significantly decreased intrusive thoughts, emotional arousal, and rumination for the children in the yoga group.⁵ For children with attention-deficit/hyperactivity disorder (ADHD), the yoga intervention group demonstrated an improved emotional and behavioral status through increases in the children’s abilities to self-soothe and cope with stress as compared with controls.¹⁶ Children exposed to trauma may exhibit emotional dysregulation and externalizing behaviors. Yoga, therefore, may be a promising adjunct therapy to treat the emotional and behavioral consequences of children’s exposure to trauma.

The current study intended to examine the effectiveness of a 14-week, yoga-based psychotherapy group (YBPG) to improve behavioral and emotional functioning and engagement during mental health treatment for school-aged boys living in an urban setting. YBPG is a trauma-informed yoga therapy that uses the primary yoga elements—breathing, meditations, and poses—to promote self-reflection and self-regulation of affective, somatic, behavioral, and cognitive functions, while it offers opportunities for social-learning attunement, modeling coregulation, and peer support.¹⁷ The current research team hypothesized that YBPG would be associated with improved affect, self-regulation, and treatment attendance.

METHODS

Participants

The children who participated in the YBPG in the current study were 10 boys, aged 8 through 12 years, with a mean age of 10.3 years (SD = 1.0), who were receiving treatment at an urban, community-based, mental health center (Table 1). Participants experienced an average of 2.1 (SD = 1.3) trauma types.

All participants had received mental health treatment for at least 3 months prior to being referred to the YBPG. Each participant’s clinician discussed the option to participate in YBPG with the participant and his caregiver. Following the receipt of permission from the caregiver and agreement by the child, a referral was made to the YBPG team. Each participant received clearance from his primary care physician prior to admission to the YBPG.

Children were excluded if they were at risk of physical aggression toward others or unable to remain in the group’s treatment room safely. The YBPG was used as an adjunct to trauma-informed mental health treatment. All participants continued in regular individual and/or family therapy with their primary clinicians during the program. The current study was approved by the institutional review board of Johns Hopkins Medical Institutions.

Table 1. Characteristics and Trauma Exposure of Boys in YBPG (N=10)

Characteristics	N (%)	Mean (SD)
Race, African-American	7 (70)	
Age, y		10.3 (1.0)
Total ACE count		2.1 (1.3)
Trauma type		
Neglect	5 (50)	
Loss/bereavement	6 (60)	
Physical abuse	4 (40)	
Domestic violence	4 (40)	
Community violence	1 (17)	
Average number of diagnoses		2.6 (2.2)
Number taking medications	9 (90)	
Average number of medications		2.6 (1.2)
Stimulant medications	7 (70)	
Antipsychotic/antidepressants	3 (30)	
Asthma medications	2 (20)	

Abbreviations: YBPG, yoga-based psychotherapy group; SD, standard deviation; ACE, adverse childhood experiences.

Procedures

Clinical History. The history of each child's trauma exposure was obtained during an initial diagnostic interview conducted with the parent and child by a licensed social worker or clinical psychologist. The following trauma exposures were elicited during the interview: (1) emotional, physical, and sexual abuse; (2) neglect; (3) grief or loss; (4) community or school violence; (5) domestic violence; and (6) parental mental illness, substance abuse, and/or incarceration.

Structured Clinical Interview for DSM Disorders, Childhood Version.¹⁸ The Structured Clinical Interview for DSM Disorders, Childhood Version (Kid-SCID) is a semistructured interview that was administered to each child during the diagnostic evaluation session. The Kid-SCID is based on the adult version of the SCID and includes modules for disruptive behavior disorders, anxiety disorders, mood disorders, psychosis, alcohol and substance-abuse disorders, and adjustment disorders.

Intervention

Trauma-informed treatment provides a framework for understanding and addressing neurobiological, psychological, and behavioral symptoms found in children who have experienced traumatic events. The YBPG was an integration of trauma-informed treatment, psychoeducational therapy, and yoga. The YBPG was designed to strengthen 6 core functions in participants: (1) safety and personal boundaries— increase awareness of personal boundaries of self and others

and improve awareness of safe and unsafe behaviors; (2) self-awareness— increase awareness of thoughts, feelings, and sensations through yoga and movement; (3) self-soothing— increase self-calming skills through the use of controlled breathing and movement strategies; (4) self-regulation— increase attention span, on-task behaviors, and emotional and behavioral self-control; (5) competency— increase the ability for successful social interaction, appropriate expression of needs and feelings, and ability to cope with stress and crisis; and (6) self-esteem— increase positive self-regard through accomplishment and awareness that all individuals are unique.

The YBPG protocol consisted of fourteen, 90-minute, weekly sessions (Table 2). The first and last sessions provided psychoeducation for each child's parent(s). During the early phase of the YBPG treatment, the group's facilitators focused on creating a safe and trusting environment for the participants. The group created agreements that established expectations for individual behavior and group interactions. The participants explored and established personal boundaries. Following the group-agreement activity, yoga poses were introduced.

The middle phase of treatment focused on increasing awareness of the self and physiological sensations and on connecting to one's emotions. Breathing fully through abdominal breathing was emphasized during movement activities and yoga poses. The exploration and practice of relaxation skills were included in every phase of treatment. The last phase of treatment focused on social interaction, asserting oneself, and practicing teamwork and leadership skills. Through the YBPG experience, participants also had the opportunity to have a corrective emotional experience by coping with loss at the end of the group.

Outcome Measures

To determine changes in functioning between baseline and postintervention, the study used the Behavioral and Emotional Rating Scale-2nd edition (BERS-2).¹⁹ It is a strengths-based measure of children's psychosocial functioning that is composed of a parent rating scale (PRS), a teacher/therapist rating scale (TRS), and a youth rating scale (YRS). All versions of the BERS-2 have 5 scales that measure the following dimensions of functioning: (1) Interpersonal Strength, (2) Family Involvement (3) Intrapersonal Strength, (4) School Functioning, and (5) Affective Strength. The PRS and YRS also have a Career Strengths scale. All dimensions together constitute the Strength Index. Higher scores on the BERS-2 suggest better functioning. Subscale scores lower than 6 indicate poor functioning, and scores of 6 and 7 show below-average functioning. A Strength Index score on the BERS-2 of 70 to 79 indicates a very high probability of emotional and/or behavioral disorders.

The BERS-2's manual reports an internal consistency a of 0.82 across age groups. Test-retest reliability of the BERS-2 at 6 weeks varies between coefficients of 0.84 and 0.98. Stability coefficients of the dimensions at 6 months range

Table 2. Description of YBPG Sessions

Session	Description
1	The group's participants and their parents attended. The parents completed psychological baseline measures. A meal or food was shared as the group's facilitators introduced families to the structure and rationale for the YBPG. The children met fellow members of the group in a supportive setting with their parents. After sharing the meal and discussion, the facilitators met with the parents only to provide psychoeducation about the YBPG. The parents were led through a relaxation exercise for at least 15 min so that they could experience the benefits of a relaxation response. It was also hoped that the parents would encourage their children to practice relaxation at home and to attend the group. Parents were also asked to discuss and create YBPG goals for their children. The group's facilitators noted the parents' goals for their children and progress was assessed in session 14 when parents met with the group's facilitators again at the end of the group.
2	This session included orientation for the YBPG's participants. A visual schedule was used for each session to support the structure and predictability of the group. That schedule helped participants with the planning and organization that supported on-task behaviors. The group created agreements with each member's input. Those agreements were posted on the wall and read aloud at the beginning of each meeting to reinforce structure and safety.
3	This session focused on body awareness. Participants became familiarized with moving their bodies. Yoga poses or the sun salutation was taught. The participants were encouraged to become aware of their breathing.
4	In this session, participants explored and practiced abdominal breathing. Participants were encouraged to breathe fully while moving and doing yoga.
5	This session allowed participants to experience relaxation and learn about its benefits. Participants were asked to increase awareness of physiological sensations as well as those sensations that are experienced in relaxation. Relaxation strategies were practiced.
6	In this session, participants learned self-awareness of sensations and identification of emotions on a body level. The session included psychoeducation about the flight, fight, and freeze responses.
7	This session focused on body boundaries and creation of a safe personal space. Awareness of body boundaries of self and of others was practiced. Participants also practiced asserting their personal space through movement activities and being aware of surroundings to promote safety.
8	In this session, participants were taught awareness of others and the ways in which behaviors and communications affect others.
9	This session allowed participants to identify and practice the skills for successful teamwork.
10	This session focused on participants' identification and practice of leadership skills in a safe and nurturing group environment.
11	In this session, participants consolidated relaxation strategies, self-regulation, and social skills that had been learned during the group.
12	This session allowed participants to discuss progress, say good-bye, and plan the final YBPG session.
13	In this session, participants celebrated the end of the group and acknowledged losses. They received achievement certificates.
14	In this session, parents completed the postmeasures. Food or a meal was shared with parents and participants. Everyone shared the progress seen and experienced by participating in the YBPG. Feedback to improve the program was elicited from parents.

Abbreviations: YBPG, yoga-based psychotherapy group.

Table 3. The Parents' Average Rating and the Sons' Self-reports on Behavior and Functional Strengths of Boys Following the YBPG

Standard Scores	Baseline Mean (SD)	Post-YBPG Mean (SD)	Mean Difference	Difference (95% CI)	P Value
Average Parent Rating (N = 10)					
Interpersonal Strength	7.2 (1.5)	8.6 (2.1)	1.4	0.5 to 2.3	.007
Intrapersonal Strength	7.5 (2.3)	9.4 (1.4)	1.9	0.5 to 3.3	.012
Family Involvement	8.5 (1.9)	9.9 (1.8)	1.4	0.04 to 2.8	.045
Affective Strength	9.5 (2.0)	10.1 (2.4)	0.6	-0.63 to 1.8	.297
School Functioning	7.5 (2.5)	8.9 (2.3)	1.4	-0.4 to 3.2	.111
Strength Index	86.6 (8.9)	95.3 (9.8)	8.7	3.7 to 13.7	.004
Average Self-report Rating (N = 9)					
Interpersonal Strength	13.3 (4.0)	11.4 (3.9)	-1.9	-5.2 to 1.4	.223
Intrapersonal Strength	12.1 (3.1)	11.0 (3.4)	-1.1	-3.2 to 0.9	.247
Family Involvement	13.2 (2.9)	10.3 (1.1)	-2.9	-5.3 to -0.5	.023
Affective Strength	13.2 (3.9)	11.0 (3.5)	-2.2	-4.8 to 0.35	.082
School Functioning	13.0 (2.3)	12.3 (2.6)	-0.7	-2.4 to 1.1	.397
Strength Index	120.0 (19.7)	108.1 (16.7)	-11.9	-26.4 to 2.6	.096

Abbreviations: YBPG, yoga-based psychotherapy group; SD, standard deviation; CI, confidence interval.

from 0.53 to 0.79.¹⁹ The 5-factor structure has shown acceptable validity for the PRS and YRS forms.²⁰ A more parsimonious 4-factor structure has been identified for the YRS; however, that structure shows some overlap between items on the Interpersonal Strength and Intrapersonal Strength scales.²¹ Cross-informant agreement between the YRS and PRS is high, with correlation coefficients ranging in one study from 0.50 for Affective Strength and Intrapersonal Strength to 0.63 for Interpersonal Strength.²²

Client Satisfaction Surveys. Written satisfaction surveys were administered to the group's participants and their parents during their final YBPG sessions. Parents who were not present for the final session completed the survey by phone. Participants and their parents responded to 10 items using a Likert-type scale, with 1 = NO!!; 2 = no; 3 = not sure; 4 = yes; and 5 = YES!!, which assessed their opinions of the group. At the bottom of the survey, participants and parents were also asked to write comments.

Statistical Analyses

Descriptive statistics were used to summarize the youths' demographic characteristics. Wilcoxon's signed rank test statistic is a nonparametric test used to compare absolute differences of pre- and post-YBPG matched samples, ranked according to size. Each rank was given the sign of the original difference. Further, *t* test analyses were conducted to estimate the mean differences from pre- to post-YBPG for the parents' and children's ratings on the BERS-2. Effect sizes were calculated by dividing the mean difference by the standard deviation of the difference. A value of 0.5 was considered a medium effect size, and values of 0.8 or greater were consistent with a large effect size. Attendance rates for other

group therapies were compared with the YBPG's. Satisfaction ratings were also reported. Significance was set at .05.

RESULTS

Boys' Characteristics

Boys in the study had an average of almost 3 (2.6, SD=2.2) psychiatric diagnoses (Table 1). All boys in the YBPG had diagnoses of ADHD and adjustment disorder with features of anxiety. The majority (60%) also had a diagnosis of oppositional defiant disorder. The majority of boys (90%) had been prescribed medication. The most common class of medication prescribed was a stimulant.

Parents' Ratings of Sons

The parents' mean BERS rating for their sons at baseline on the Interpersonal Strength scale was 7.2 (SD = 1.5), in the below-average range (Table 3). Following the YBPG, a statistically significant improvement occurred to a mean of 8.6 (SD = 2.1), on that scale, with a mean difference of 1.4 points, *P* = .007, effect size = 1.1. The parents' mean rating for their sons on the Intrapersonal Strength scale, with a mean of 7.5 (SD = 2.3) at baseline, was slightly higher than that for the Interpersonal Strength scale. The mean improvement in the parents' rating on that scale, to 9.4 (SD = 1.4), was 1.9 points, *P* = .012, effect size = 1. The parents' rating on the Family Involvement scale was significantly improved, from 8.5 (SD = 1.9) to 9.9 (SD = 1.8), with a mean increase of 1.4 points, *P* = .045, effect size = 0.7. Parents' ratings on the Strength Index scale also demonstrated significant improvements, from 86.6 (SD = 8.9) to 95.3 (SD = 9.8), with a mean of 8.7, *P* = .004, effect size = 1.2. The changes in affective strength and school functioning were not significant.

Table 4. Results of Patient Satisfaction Survey

Question	YBPG Participant		Parent	
	Mean	SD	Mean	SD
I/my child liked the yoga group.	4.91	0.28	4.71	0.56
The group leaders treated me (and my child) with respect.	4.91	0.28	4.81	0.51
I/my child felt safe during the group.	4.81	0.47	4.71	0.56
The group helped me/my child learn to pay attention better.	4.61	0.77	4.38	0.86
The group helped me/my child learn to use breathing and movement to calm down.	4.86	0.35	4.43	0.75
The group helped me/my child share my feelings in safe ways.	4.75	0.73	4.38	0.97
The group helped me/my child learn to pay attention to my/his thoughts, feelings, and body.	4.64	0.64	4.29	0.96
The group helped me/my child feel good about myself/himself.	4.88	0.36	4.52	0.68
The group helped me/my child learn about safe boundaries (mine/his/others’).	4.75	0.57	4.38	0.92
The group helped me/my child learn how to get along with others.	4.58	0.97	4.52	0.68

Abbreviations: YBPG, yoga-based psychotherapy group; SD, standard deviation.

Boys’ Self-report

The boys’ average self-report on all scores was in the normal range at baseline for all measured areas of functioning. Their scores stayed within the normal range following the YBPG. Although remaining in the normal range, the mean Family Involvement score, with a mean of 10.3 (SD = 1.1), demonstrated a statistically significant decrease of 2.9 points, from a baseline of 13.2 (2.9).

Parents’ Reports Compared With Sons’

Comparing the parents’ ratings of their sons’ behaviors with the sons’ self-reports at baseline, all areas of functioning demonstrated statistically and clinically significant differences. The most marked subscale mean difference was 6.0 points (SD=3.7) on the Interpersonal Strength scale, with the parents’ mean rating being 7.3 (SD=1.6) versus the sons’ mean rating being 13.3 (SD=4.0). The lowest mean difference was 3.7 (SD=1.5) points on the Sffective Strength scale, with the parents’ mean rating being 9.3 (SD=2.0) versus the sons’ mean rating being 13.0 (SD=2.3). Sons consistently rated their functioning higher than did their parents; the mean difference on the Strength Index was 33.8 (SD=15.6).

Following completion of the YBPG, the parents’ and children’s average scores were closer. Only the mean School Functioning subscale score was statistically different; sons’ self-report was 3.6 points higher (SD=1.8). For the Strength Index scale, the mean difference was 12.7 (SD=15.9) between the parents’ mean score of 95.3 (SD=9.8) and the sons’ mean score of 108.0 (SD=15.8). Both the parents’ and the children’s average functional scores following the YBPG were in the normal range. It is important to note that the averages and standard deviations reported in this section differ from those in Table 3 due to the variance of the total number of parent and child responses at baseline and 3 months.

Attendance

Attendance at the YBPG group was compared with that of other mental health interventions used at the clinic. These are non-yoga-based group treatments attended by patients, including socialization and expressive therapies such as art and photography groups, skill building group, and the trauma-specific structured psychotherapy for adolescents responding to chronic stress (SPARCS). The mean for the number of sessions attended by the YBPG’s participants was 9.4 (SD=3.2), with a range was 1 to 14. Except for the socialization group, the YBPG had significantly higher rates of attendance compared with all other clinical mental health groups, including (1) the art group, with a difference of 0.12, $P=.0063$; (2) the photography group, with a difference of 0.15, $P=.0037$; (3) the skill building group, with a difference of 0.33, $P=.001$; and (4) the SPARCS group, with a difference of 0.27, $P=.001$.

Client Satisfaction

Participants’ and parents’ responses to the YBPG were very positive (Table 4). Of a total of 5 possible points, participants’ mean responses ranged from a low of 4.58 (SD=0.97) for the item “The group helped me learn how to get along with others” to 4.91 (SD=0.28) for the items “I liked the yoga group”; “The group leaders treated me with respect”; and “The group helped me learn to use breathing and movement to calm down.” Parents’ mean responses ranged from a low of 4.29 (SD=0.96) for the item “The group helped my child learn to pay attention to his thoughts, feelings, and body” to 4.81 (SD=0.51) for the item “The group leaders treated him with respect.”

Written responses suggested that participants and their parents had a positive experience with the YBPG. Multiple participants expressed that they wanted to do the group again.

Parents reported improvements in their child's self-regulation. For example, comments included "The group was very fun. I learned a lot, and I would love to be in the next one (participant)!"; "I learned to pay attention more (participant)"; "I know my triggers now (participant)"; "Now I'm sharing more with other people than I have shared before (participant)"; "At first, he didn't want to come, but as he got to like it, he did not want to stop (parent)"; "My child is doing really well at school now with focusing (parent)"; "My child is sleeping better now (parent)"; "My son taught me yoga at home (parent)"; and "My child became more responsible (parent)."

DISCUSSION

Empirical findings have documented the adverse effect of childhood trauma on the social and emotional development of children. The use of yoga and mindfulness as an adjunct to trauma-informed mental health treatment through the YBPG model may help to mitigate the adverse impact of trauma and stress on the developing child.

In the current study, the improvements in the parents' perceptions of their sons' functioning were supportive of the positive complementary effects of yoga on the children's family functioning, interpersonal strength, and overall total strength. It is interesting that the boys' functional self-assessments pre-YBPG did not reflect their parent's perceptions of their sons' functioning.

Boys who have a history of childhood trauma may experience dissociation and a restricted ability to express anxiety and fear.¹⁴ Thus, in the current study, the boys' ability to self-reflect may have been limited at the beginning of the YBPG. Their judgment about their functioning may overestimated the scores, based on a wished-for existence or attempts to provide responses that were socially acceptable.

It should be noted that the boys' self-reports, on average, indicated lower, but normal, scores on the Family Involvement scale at the end of the YBPG treatment. That finding could be due to the boys' willingness to disclose and share more information at the end of their experience in the group. Notably, both their baseline and their post-YBPG scores were in the high range for Family Involvement. Therefore, although the scores were statistically different, the difference was not clinically significant.

Conversely, the parents, stressed by poverty and violence, may have exaggerated the severity of their son's problems in functioning, causing a lower functional rating for their children. Notably, following completion of the YBPG, the concordance between parent and child improved, and all measures were within the normal range.

Although the positive effects of movement, mindfulness, and yoga have been documented in previous literature,^{4-6,23} the current study was unique in its preliminary investigation of the effects of yoga on the daily functioning and relationships of African-American boys, using a mixed-methods approach. Male youth living in urban environments are often challenging to engage in a clinical setting.²⁴ Race and ethnicity have been consistent predictors of treatment

attendance, with African-Americans attending fewer treatment sessions than Latinos.²⁴ More important, in the current study, the YBPG model was effective in engaging and meeting the unique needs of an underserved population of children and families, resulting in high attendance rates.

High attendance rates are often difficult to obtain in mental health treatment of urban youth and families. In the current study, both the boys and their parents reported high levels of satisfaction with the program. The responses on the satisfaction surveys indicated that the boys attending the YBPG and their parents felt respected and safe in the group. The survey's results were significant because African-American families can be more difficult to engage in mental health therapy due to distrust resulting from prior, negative treatment experiences.

The goal of YBPG is to help participants become more aware of themselves and others and to incorporate their integration of feelings, thoughts, and behaviors to improve their self-regulation and social functioning. As was proposed by Mendelson and colleagues,⁵ it is likely that the boys who participated in the YBPG in the current study had learned to regulate their emotions and to incorporate skills in adaptive stress responses using the principles of yoga and mindfulness. Increased emotional regulation may have improved their overall psychosocial functioning.

Generalization of the results of the current clinical research has its limits. The main limitation is the small sample size. Although the statistically and clinically significant changes in the BERS-2 measures are encouraging and suggest robust change in the group as a result of the intervention, further research is needed using larger sample sizes.

Further, differences were shown in the parents' ratings, but the children's self-report ratings did not demonstrate statistically significant changes. Discordance between parents' and children's ratings has previously been documented in rating scales of child behavior.²⁵⁻²⁷ Measures with improved sensitivity for assessing youths' self-observations are needed to clarify the children's perceived benefits from the intervention. An improved assessment might be accomplished by having the youths self-rate following each of the group's sessions.

It is important to note that the clinical use of yoga in the current study has provided encouraging evidence of the effectiveness of yoga as an adjunct to individual psychotherapy. The results suggest that therapists can recommend a yoga practice outside of the psychotherapy hour to help improve the emotional regulation and mental health functioning of youth exposed to trauma. The ability to attribute improvements in the parents' perception of the children's functioning solely to YBPG was not possible given the study's clinical design. The results also suggest that the YBPG can improve functioning as a complementary intervention in combination with trauma-informed mental health treatment.

Future research to study the effectiveness of YBPGs should involve larger numbers of children as participants, using a randomized design. Future studies would also benefit

from more specific selection criteria, based on the diagnosis of the participants and level of behavioral deregulation at recruitment. Studies of the effectiveness of YBPGs for girls with a history of childhood trauma are also an important area to investigate. In addition, longitudinal studies could provide evidence for the sustainability of the clinical effects of the YBPG intervention.

CONCLUSIONS

In the current study, results suggest that YBPG is a promising complementary intervention for an underserved urban African-American population of boys 8 to 12 years of age. Family functioning, interpersonal strengths, and overall total strengths improved in the parents' perceptions of their sons' functioning, thus supporting positive effects of yoga on the children. In addition, participant attendance to the YBPG was high and the children and parents recorded high satisfaction rates for the YBPG. In summary, YBPG may prove to be a useful adjunct therapy to treat the emotional and behavioral consequences of childhood trauma in school-aged boys.

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AUTHOR DISCLOSURE STATEMENT

There were no known conflicts of interest between any of the authors and the research sites or participants.

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