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Enhancing Coping and Supporting Protective Factors After a Disaster: Findings From a Quasi-Experimental Study

Tara Powell¹ and Sanna J. Thompson²

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Abstract

Objective: This article presents the Journey of Hope (JoH), a school-based intervention for children who have experienced a collective trauma such as a natural disaster. Through the use of group work, the JoH focuses on building coping skills and enhancing protective factors to help children recover. **Method:** This quasi-experimental research included 102 children impacted by tornadoes in Tuscaloosa, Alabama in 2011. **Results:** Through an hierarchical linear model analysis with ($n = 48$) from the JoH group and ($n = 54$) from a wait-list control group, the outcomes indicate that after participation in the JoH youth had increased coping skills, $F(100) = 5.270$, $p < .05$, and prosocial behaviors, $F(95) = 4.286$, $p < .05$. This is the first quasi-experimental design to be conducted on the JoH; findings provide preliminary evidence of the effectiveness of this broad-based postdisaster intervention. **Conclusion:** Future replication studies with larger samples in other societies impacted by a natural disaster are needed to further evaluate the JoH's impact in enhancing coping and building resilience.

Keywords

disaster, coping, risk, protective, children

Background

Children are one of the most vulnerable populations during and after an acute trauma such as a natural disaster (Garrett et al., 2007; Kataoka, Rowan, & Hoagwood, 2009; La Greca & Silverman, 2009; Walsh, 2007). Children of all ages rely heavily on their parents or caregivers for support and are susceptible to behavioral, physiological, and emotional issues in the aftermath of the event (Anderson, 2005; La Greca, Silverman, Vernberg, & Roberts, 2002; Peek, 2008). Young people may also experience a range of psychological stressors, such as fear of death or loss of a loved one, the loss of a home and community, displacement to a strange neighborhood or school, and even separation from their family (Gewirtz, Forgatch, & Wieling, 2008; La Greca & Silverman, 2009).

Acute events are often short-lived and occur at a specific time and place. Examples of acute trauma can include gang-related violence, terrorist attacks, school shootings, natural disasters (i.e., hurricanes, earthquakes, and floods), serious motor vehicle accidents, violent or sudden loss of a family member or loved one, and sexual or physical assault (i.e., being raped and beaten or shot) (National Child Traumatic Stress Network, 2012). The majority of young people will experience some form of emotional or physical reaction after an acute event such as a natural disaster. For example, young people between the ages of 5 and 12 may exhibit fear, guilt about the event, sadness, irritability, anger, aggression, clingy behavior, nightmares, school avoidance, poor concentration,

and withdrawal from activities and friends (Federal Emergency Management Organization (FEMA), 2013; Lazarus, Jimerson, & Brock, 2002).

Mental health reactions may vary depending on the type of trauma (natural disaster vs. mass violence). A review by Norris and colleagues (2002) found that 67% of those who experienced mass violence were severely impaired compared to 39% after technological disasters and 34% after natural disasters. A number of studies have also found that proximity and exposure to the event contribute to the severity of symptoms such as post-traumatic stress, depression, and anxiety (Galea, Nandi, & Vlahov, 2005; Miller & Rasmussen, 2010; Norris et al., 2002).

While many reactions will subside over time, research has demonstrated the importance of positive coping and building resilience to help children overcome the distress associated with trauma-inducing situations (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Peek, 2008).

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Risk Factors Associated With Disaster-Related Trauma

Experiencing a natural disaster is an acute trauma that can lead to immediate and long-term mental health challenges (Masten & Obradovic, 2008). Children's reactions to disasters vary greatly depending on their level of exposure, age, intellectual capacity, gender, and family and individual support systems (Madrid, Grant, Reilly, & Redlener, 2006; Tolin & Foa, 2006). As they may experience displacement from homes and community, loss of family members, and disruption of normal routines (La Greca & Silverman, 2009), children are at greater risk for a number of emotional and adjustment issues in the year following a disaster. They may experience heightened anxiety, anger, depression, and behavioral or conduct disorders, such as inattention or hyperactivity which may lead to a variety of poor peer, teacher, and familial interactions (Dube et al., 2001; Jaycox, Morse, Tanielian, & Stein, 2006; McFarlane & Van Hooff, 2009; Putnam, 2006; Strauss, Dapp, Anders, von Renteln-Kruse, & Schmidt, 2011). Post-traumatic stress disorder (PTSD), one of the most commonly measured postdisaster mental health disorders, has been reported as high as 18% during the weeks following a disaster and through the first year (La Greca & Silverman, 2009). Poor or nonexistent coping strategies, combined with a traumatic experience, only increase the risk for negative outcomes (Boyden & Mann, 2005).

Coping and Other Protective Factors Associated With Disaster Trauma

Resilience, as described by Masten and Obradovic (2006), is defined as the ability for a person to have a positive outcome even after exposure to a serious threat. Risk, on the other hand, is identified as an adverse event that can be considered stressful and may hamper normal functioning (Masten & Obradovic, 2006; Stevenson & Zimmerman, 2005). According to Masten and Obradovic (2006), the construct of resilience can be further defined as the process of overcoming adverse consequences from exposure to risk, avoiding harmful paths related to risk, and effectively coping with traumatic experiences (Masten & Obradovic, 2006; Stevenson & Zimmerman, 2005). The theory of stress and coping suggests a multidimensional process exists when individuals cope with stressful situations (Folkman, 1984; Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). This complex process includes: (1) an individual's experience of an adverse situation and how they associate it to their personal meaning of the event and (2) the cognitive and behavioral attempts to control, lessen, or endure strains that are formed from the stressful situation.

Children can exhibit both positive and negative coping responses after experiencing a disaster. Negative coping strategies may include avoidance of similar situations, ruminating, and expressing frustration about the stressor. Negative and avoidant coping can often lead to maladjustment and increased mental health symptoms (Dempsey, 2002; Rosario, Salzinger, Feldman, & NgMak, 2003). Positive strategies often involve active coping such as engaged efforts to manage the stress,

positive reappraisal of the situation, and problem solving (Dempsey, 2002; Lengua, Long, & Meltzoff, 2006). Children with positive, active coping responses have a greater ability to respond to and remain resilient after a traumatic event (Dempsey, 2002; Masten & Osofsky, 2010; Rosario et al., 2003). After a disaster, healthy coping strategies may promote resilience by mediating mental health disorders and reducing symptomology (Clarke, 2006; Compas, Connor-Smith, Saltzman, Harding-Thomsen, & Wadsworth, 2001; Evans & Oehler-Stinnett, 2006; Teicher, Andersen, Polcari, Anderson, & Navalta, 2002). Positive thinking, cognitive restructuring, emotional regulation, acceptance, and emotional expression are coping strategies that have been linked to reduce anxiety, depression, and PTSD symptoms (Kronenberg et al., 2010; Lengua et al., 2006; Wadsworth et al., 2004; Wadsworth, Santiago, & Einhorn, 2009).

In addition to healthy coping responses, several protective strategies have been shown to improve children's ability to overcome adversity (Masten & Obradovic, 2006; Stevenson & Zimmerman, 2005; Walsh, 2007; Williams, Alexander, Bolsover, & Bakke, 2008). Protective factors are influences that assist children to guard against or avoid risks and increase resilience in traumatic situations (Kirby & Fraser, 1997). These include a sense of agency, affect regulation, problem-solving skills, empathy, shared experiences, community connections, positive relationships, social support from peers and adults, and a positive school, home, and community environments (Betancourt & Khan, 2008; Masten & Obradovic, 2006; Sapienza & Masten, 2011; Stevenson & Zimmerman, 2005). These prosocial protective behaviors can also help mitigate post-traumatic stress symptoms (Cohen et al., 2009; Williams et al., 2008).

Postdisaster Interventions

Although postdisaster intervention research has generally focused on the reduction of PTSD symptoms (Silverman et al., 2008), there has been a recent focus on more broad-based interventions directed toward enhancing protective mechanisms and coping capacity (La Greca, 2007; La Greca, Silverman, Lai, & Jaccard, 2010; Moore & Varela, 2010). Interventions that provide psychoeducational information and promote empowerment may benefit children, as they attempt to overcome difficulties associated with the disaster (Hobfoll et al., 2007; Peek, 2008; Sapienza & Masten, 2011).

It has also been suggested that postdisaster interventions should be easily accessible and address prior and current traumatic events and losses (Jaycox et al., 2010; Salloum, Carter, Burch, Nan Garfinkel, & Oversteet, 2010). Silverman and colleagues (2008) examined 21 studies of evidence-based psychosocial programs for children and adolescents who exhibited psychological symptoms related to traumatic events and found that most of these interventions focused on cognitive-behavioral methods with the aim to treat the symptoms of PTSD.

Cognitive Behavioral Intervention for Trauma in Schools, for example, is a cognitive behavioral intervention designed for children with disaster-related mental health symptoms and

focuses on: (1) educating youth about common reactions to stress or trauma, (2) linking thoughts and feelings together to ward off negative thoughts, (3) drawing and writing to expose participants to their trauma memory, and (4) introducing and practicing social problem solving (Morsette et al., 2009; Stein et al., 2002). Trauma Focused-Cognitive Behavioral Treatment is a clinician-implemented intervention focusing on parenting skills, relaxation, affective modulation, cognitive coping skills, and trauma and narrative processing (Dorsey, Briggs, & Woods, 2011). Grief and Trauma Intervention for Children is a 10-session intervention model focusing on topics such as anger questioning and guilt through narrative processing (Salloum & Overstreet, 2008).

While these strategies may be appropriate for some children, programs concentrating on reducing disaster-related psychopathology are limited to children who are exhibiting mental health symptoms or adverse emotional reactions (Evans & Oehler-Stinnett, 2006; Neria, Nandi, & Galea, 2008). Recent studies have examined the structure of postdisaster recovery programs (first few weeks to 1 year) and found a gap in broadly accessible programming for children that are delivered during this period (La Greca & Silverman, 2009; Wolmer, Hamiel, & Laor, 2011; Wolmer, Laor, Dedeoglu, Siev, & Yazgan, 2005). Moreover, few interventions include psychoeducational techniques (not therapeutic) that are available to entire classrooms (La Greca & Silverman, 2009; Wolmer et al., 2005).

Although it is understood that therapeutic programs can help children and young people overcome PTSD symptoms, broad-based interventions that focus on building healthy coping strategies and enhancing protective factors can be effective, widely delivered, and may mitigate future mental health issues associated with the disaster (Gelkopf & Berger, 2009; La Greca & Silverman, 2009). To address the gap in understanding how broadly implemented post disaster psychoeducational programs support children who have experienced a natural disaster, this study examines one intervention, the Journey of Hope (JoH), and evaluated its effectiveness in building protective factors and coping in young people who have experienced a natural disaster.

The JoH Intervention

The JoH is a manualized intervention that aims to support children in normalizing emotions associated with a traumatic event while developing positive coping strategies. The core objectives of the JoH are to: (1) facilitate understanding and normalization of trauma-related emotions; (2) promote protective factors such as commitment to school, prosocial behaviors, and peer relationships; (3) minimize risk factors including conduct problems, inattention, and poor peer relationships; and (3) encourage development of positive coping strategies such as problem solving, emotional regulation, and expressing feelings (Save the Children, 2009).

The intervention seeks to enhance resilience and build protective factors through building internal and external coping resources. This is completed by helping children identify

healthy ways to cope with difficult circumstances both in school and at home. Each session teaches specific techniques to effectively process and address difficult situations. More specifically, the children are encouraged to discuss each topic and strategize ways they can manage a situation which may be appraised as difficult. This is done by helping youth understand that most people experience emotions such as fear, anger, sadness, or anxiety, and helps them identify both internal and external resources to cope with these emotions. The group is conducted in a safe setting where youth can process and assign meaning to a difficult situation and help establish healthy cognitions related to the event. Moreover, the intervention model attempts to help youth both understand and process their emotions through establishing meaning to difficult life events without using self-blame or other negative coping mechanisms.

The JoH includes content for eight 1-hour sessions that are generally delivered to groups of 8–10 children/adolescents in a school-based setting. The model was designed for groups of children in kindergarten to second grade, third to fifth grade, and sixth to eighth grade and incorporates developmentally appropriate activities to promote discussion, cooperative play, arts, and literacy to address common disaster-related emotions. The intervention model utilizes group work techniques and experiential and reflective learning techniques to help children recognize and process common emotions and build capacity to cope with those emotions after a traumatic situation (Malekoff, 2008; Salloum, Garside, Irwin, Anderson, & Francois, 2009). The following study examined the impact of the JoH on elementary students in third to fifth grade in Alabama following a devastating tornado that struck the city in the spring of 2011.

Study Aims and Hypotheses

Given the lack of research for widely accessible postdisaster interventions for children, this study sought to implement and evaluate the effectiveness of the JoH among elementary school children following a natural disaster. Based on knowledge of risk and protective factors related to children's trauma experiences and the impact of positive coping in reducing mental health symptomology, this study hypothesized that students engaged in the JoH intervention would exhibit (1) improved protective factors, such as commitment to school and prosocial relationships; (2) decreased risk factors such as conduct problems, inattention, emotional problems, and peer relationship problems; and (3) improved positive coping skills beyond those experienced by students not engaging in the JoH intervention.

Method

Setting

This study is part of a larger effort to deliver the JoH intervention to children between 2nd and 12th grades who experienced a natural disaster. On April 27, 2011, a class E-4 tornado that spanned more than a mile struck Tuscaloosa, Alabama; over 1,000 people were injured and approximately 65 were killed. This was the highest death toll from a tornado in the United

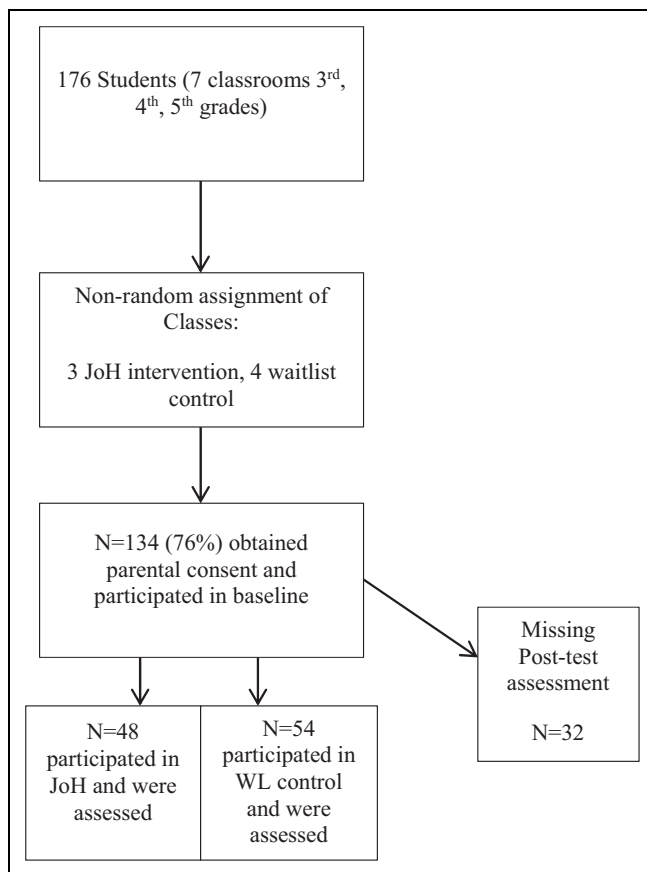


Figure 1. Flow of participants through the Journey of Hope study.

States since 1955 (National Aeronautics and Space Administration, 2011). In response, a charitable organization, Save the Children, collaborated with Tuscaloosa city schools to provide the JoH programming to students. Three schools were included in this study due to their location in the highest impact areas of the tornado: One school was completely destroyed, two were damaged, and all of the schools included students who lived in areas directly affected by the tornado. The study was conducted from September to December 2011 with students in third through fifth grades.

Study Design

A quasi-experimental wait-list control design was utilized to evaluate the effectiveness of the JoH program among children across the three schools. Due to school district's logistical constraints, schools were not randomly assigned to a condition, and each school had both experimental and wait-list control participants. In order to maintain ethically responsible practice, the schools only agreed to a control group if all children ultimately received the JoH program; as shown in Figure 1, those assigned to the control group received JoH within 1 month after the data collection for both groups was complete. None of the control group's experience with JoH are presented in this article.

A total of 134 students obtained parental consent to participate in the study. Although not all of the students obtained

Table 1. Sample Demographics.

	Total	Intervention	Control	χ^2
Age				13.65**
8	20 (19.6%)	12 (29.2%)	6 (11.1%)	
9	39 (38.2)	22 (45.8%)	17 (31.5%)	
10	33 (32.4)	11 (22.9%)	22 (40.7%)	
11	9 (8.8)	1 (2.1%)	8 (14.8%)	
12	1 (1.0)	0	1 (1.9%)	
Grade				7.49*
3	33 (32.4%)	21 (43.8%)	12 (22.2%)	
4	41 (40.2%)	19 (39.6%)	22 (40.7%)	
5	28 (27.5%)	8 (16.7%)	20 (37.0%)	
Gender				.05
Male	48 (47.1%)	22 (45.8%)	26 (48.1%)	
Female	54 (52.9%)	26 (54.2%)	28 (51.9%)	
Ethnicity				4.05
African American	82 (80.4%)	39 (81.3%)	43 (79.6%)	
Native American	2 (2.0%)	1 (2.1%)	1 (1.9%)	
White	6 (5.9%)	2 (4.2%)	4 (7.4%)	
Latino	6 (5.9%)	4 (8.3%)	2 (3.7%)	

*** $p < .001$. * $p < .05$.

consent to participate in data collection portion of the study, all participated in the JoH intervention activities. After enrollment, all participants were given a baseline pretest and the youth assigned to the experimental group participated in the JoH, while those in the wait-list control received the intervention in the following wave of program implementation. There were a total of 32 students who did not complete the posttest due to transitioning schools during the study. Changing schools is common after disasters because during the rebuilding process families often relocate to different neighborhoods once permanent housing is secured. In the final analysis, there were a total of $N = 102$ students, 48 in the experimental group and 54 in the control group. Of the three schools, there were 40 in School A, 47 in School B, and 15 in School C.

Sample Selection and Assignment to Groups

Children were referred to the JoH program by teachers and social workers based on their level of distress and functioning in the classroom. The teachers and social workers were instructed to recruit a range of students from those who were coping well to those who were having some difficulties in the classroom. Classrooms were assigned to the experimental or wait-list condition based on the teacher's preference concerning timing of intervention to minimize disruption in academic instruction. As shown in Table 1, the majority of the students were African American ($n = 82$, 80.4%) and more than half ($n = 54$, 52.9%) were females. Participants were enrolled in third grade ($n = 33$, 32.4%), fourth grade ($n = 41$, 40.2%), or fifth grade ($n = 28$, 27.5%).

Procedure

Following approval by principals and administrators at each school, consent forms were sent home to student's parents/

primary caregivers. Only students who received parental consent and provided assent participated in the study. Youth were also excluded from participation if the school social worker determined the student had severe cognitive disabilities or emotional difficulties that made them unable to benefit from group processing. These students were referred for individual counseling through the school social worker.

The research followed ethical guidelines established by the affiliated university's institutional review board. Baseline measures were completed by both teachers and participants approximately 1 week before participation in the JoH intervention and posttests were conducted within 1 week after conclusion of the eight sessions. Trained master's level social workers administered the questionnaires and assisted students in reading and completing the questionnaires. The social workers were also available to assist students if they exhibited distress.

Measures

The pre- and posttests consisted of students' self-report measures to assess coping skills and peer relationships, and a teacher report measure to assess risk and protective factors such as prosocial behavior, peer problems, conduct problems, hyper/inattention, and emotional distress. Sample demographics were measured as age (8–12 years of age), gender (*male* = 1 and *female* = 2), race (*African American* = 1, *native American* = 2, *White* = 3, and *Latino* = 4), and current grade in school (*third* = 1, *fourth* = 2, and *fifth* = 3).

Youth Report Measures

Youth coping index. Youth coping index (YCI) measured youths' self-reported coping by assessing the degree to which children used specific healthy coping behaviors the children use when they experience difficulties (e.g., try to talk things out and compromise, try to figure out how to deal with problems, try to maintain friendships, and talk with someone about how your feel) to manage life stressors (McCubbin, Thompson, & McCubbin, 1996). Participants rate the frequency of their use of 31 coping strategies, scored on a 5-point Likert-type scale (0 = *Never*, 1 = *Hardly ever*, 2 = *Sometimes*, 3 = *Often*, and 4 = *Most of the time*). Internal consistency for the YCI is high (Cronbach's $\alpha = .86$; McCubbin et al., 1996). The predictive validity has also been established through correlating the YCI to the outcomes of youth in a residential treatment program and by conducting a discriminant analysis of YCI's success in predicting successful adaptation of youth in the program (McCubbin et al., 1996). A reliability analysis for the sample in this study was found to be adequate ($\alpha = .72$).

Commitment to school. Commitment to school was measured by the Community that Cares (CTC) survey, a validated measure that assesses risk and protective factors for children and adolescent problem behaviors. For the purpose of this study, the commitment to school subscale was included as a protective factor that measured indicators of liking school, time spent on

homework, and perceiving schoolwork as relevant. Items were measured on a 4-point Likert-type scale (1 = *NO! definitely not true*, 2 = *no, mostly not true*, 3 = *yes, mostly true*, and 4 = *YES! definitely true*). Internal consistency reliability for the commitment to school subscale has been shown to be adequate (.71–.79) in previous research (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002) and acceptable ($\alpha = .69$) in this study.

Teacher Report Measure

Strengths and difficulties questionnaire. Strengths and difficulties questionnaire (SDQ) is a brief 25-item teacher report of children's psychological symptoms and impairment (Goodman, 2001) and used for children between the ages of 4 and 16. Items are scored on a 3-point Likert-type scale (0 = *Not true*, 1 = *Somewhat true*, and 2 = *Certainly true*), indicating the amount each symptom the target child is exhibiting (Goodman, 2001). The SDQ consists of 5 subscales with 5 items per scale. The internal reliability for the current study's sample was adequate for the total scale ($\alpha = .77$). Subscale scores were calculated from the SDQ to identify prosocial attitudes, emotional distress, peer interaction, conduct problems, and inattention/hyperactivity; reliability was adequate for subscales of emotional symptoms ($\alpha = .64$), conduct problems ($\alpha = .70$), hyperactivity ($\alpha = .84$), and prosocial behaviors ($\alpha = .86$), but poor for peer problems ($\alpha = .52$).

Facilitator Training

Facilitators of the JoH intervention were master's level social workers, counselors, or psychologists with prior experience working with children in a school-based setting. The training was comprised of three 8-hour days of contact hours that provided education on children's common reactions after emergencies, training on group work techniques, and role-playing exercises. Trainees were also provided education on mandatory reporting laws within the school system concerning child abuse. Those who were trained in the JoH were also evaluated concerning their knowledge of the program and children's reactions or responses to traumatic events by assessing their pretraining and posttraining knowledge of children's reactions to trauma, program facilitation, and psychoeducational knowledge. To ensure program fidelity, facilitators were provided technical assistance throughout the implementation of the program and the program manager conducted weekly group observations. Additionally, facilitators were required to complete fidelity checklists to monitor their own compliance with delivery of specific program components.

Statistical Analyses

Data were entered, checked for accuracy, and individual items were summed to create total scores for the various scales. A hierarchical linear model (HLM) was used because of its ability to assess change in the dependent variables by group over time in a multilevel structure (Snijders & Bosker, 1999). More

specifically, HLM was used because it was appropriate for the analysis of nested data, thereby identifying relationships between the predictor and outcome variables through calculating regression relationships at Level 1 (time) and Level 2 (individual) (Woltman, Feldstain, MacKay, & Rocchi, 2012). Using HLM, both the within- and between-group regressions depicted the relationship between participation in the JoH and the outcome variables. Moreover, HLM analyses were conducted to account for the variation of the individuals by time (baseline and posttest) temporally nested within individuals (Luke, 2004). This analysis method was also used because of its ability to examine cross-level data relationships and correctly disentangle the effects of between- and within-group variance. It is also a favored method for nested data because fewer assumptions are required to be met than with other statistical methods (Raudenbush, Bryk, & Congdon, 2002), and can accommodate lack of sphericity, non-independence of observations, and small group sample sizes (Woltman et al., 2012).

To determine the appropriate sample size for the study and whether the study design have power to detect significant change between pre- and posttests, a power analysis was conducted (G*Power). The power analysis for an HLM model with two groups and two repeated measures was calculated. Results revealed that, assuming an effect size of .20, an α of .05, and a power of .80, a sample size of 81 individuals should be sufficient to detect a significant difference between pretest and posttest (Faul, Erdefelder, Buchner, & Lang, 2009).

Missing value patterns were examined for the seven dependent variables (coping, emotional symptoms, conduct problems, inattention/hyperactivity, peer relationship problems, prosocial behaviors, and commitment to school) at both time points; very little missing data (96–100% complete) were discovered. Little's missing completely at random (MCAR) was conducted on the entire sample and supported the hypothesis that missing values occurred completely at random ($\chi^2_{4050} = 4087$; $p = .33$; Little, 1988). Considering the data were MCAR, the means were imputed using the replace missing values command in Statistical Package for the Social Sciences (SPSS).

Following dummy coding of the intervention group as 0 and the wait-list control group as 1 to observe the differences between groups, regression slopes were estimated in HLM for the individual level-dependent variables at the school level. The fixed effects of treatment, time, and treatment by time were the parameters of interest for establishing the program impact estimates. Effect sizes were calculated using Cohen's d , and values were interpreted as follows: .2 is small, .5 is medium, and .8 is a large effect size (Cohen, 1988). All statistical analyses were conducted with the SPSS, version 20.0.

Results

Baseline Measures

To investigate whether the groups were equivalent, the experimental and wait-list control conditions at Time 1 (using

independent samples t -tests) and demographic variables (using χ^2 tests of independence) were conducted. No significant differences were found on demographic variables at pretest; however, significant differences ($p < .05$) were found on the YCI.

Upon examining the score differences at baseline, it appeared that variation in disaster exposure was dissimilar between the groups. The intervention group was primarily from a school that was destroyed by the tornado, and children were temporarily relocated to another school, while students in the wait-list control group experienced the tornado but were not displaced from their school.

Intervention Effects

HLM analyses tested the differential effect of the treatment (JoH group) compared to the wait-list control across the dependent variables. Table 2 presents results of the separate HLM analyses for coping (YCI), prosocial attitudes, emotional distress, inattention/hyperactivity, peer problems and conduct problems (SDQ), and self-reported commitment to school (CTC). Estimated marginal means and standard errors (SEs) are provided for each time point with interaction effects. All statistical significance tests were evaluated with an α level of .05. Cohen's d was also calculated to determine the standardized effect size.

As Table 2 indicates, there were two Time \times Group interactions indicating a change over time between the JoH and wait-list control groups. The first interaction effect of treatment by time in predicting YCI scores was statistically significant. Children receiving the JoH intervention reported a significant increase in coping skills from baseline to posttest, $F(100) = 5.270$, $p < .05$, compared to the control group. The main effect for time was also significant as scores showed a significant linear increase for those in the JoH group, $F(100) = 4.368$, $p < .05$; the control group illustrated no change. A moderate effect size ($d = .44$) was also found for the JoH group, according to standards by Cohen (1988) suggesting values of 0.3 indicated a moderate effect size.

The second treatment affect was found for the prosocial behavior subscale. There was a significant Treatment \times Time interaction effect for the teacher report of prosocial behavior on the SDQ, $F(95) = 4.286$, $p < .05$. The Treatment \times Time interaction affect indicated that those in the JoH group had a significant increase in prosocial behaviors between pre- and posttest, whereas there was no change in the control group between the two time points. A medium effect size ($d = 0.41$) was found for this scale. Although the children's self-reported commitment to school subscale did not have a statistically significant Treatment by Time interaction, it did have a small effect size ($d = .28$). No statistically significant interactions between treatment and time were detected for the other teacher reported subscales of the SDQ including peer problems, inattention/hyperactivity or conduct problems, or emotional distress. However, the data trended in the hypothesized direction.

Table 2. Results of HLM Major Outcomes.

Outcome Variable	JoH (mean, SE)	Control (mean, SE)	Mean Difference [95% CI]	Mean Difference, <i>p</i>	Treatment	Treatment × Group	Effect Size (Cohen's <i>d</i>)
Protective factors							
Coping (YCI)							0.414
T-1	103 ± 1.630	110 ± 1.537	6.50 [2.06, 10.95]	.005	<i>F</i> = 5.270	<i>F</i> = 4.368	
T-2	108 ± 1.484	110 ± 1.399	1.988 [2.06, 6.03]	.332	<i>p</i> = .024*	<i>p</i> = .039*	
Prosocial behavior (SDQ subscale)							0.411
T-1	7.58 ± .531	8.57 ± .569	.99 [−.30, 2.28]	.125	<i>F</i> = 1.153	<i>F</i> = 4.286	
T-2	8.31 ± .524	8.58 ± .566	.27 [−1.01, 1.55]	.661	<i>p</i> = .299	<i>p</i> = .041*	
Commitment to school (CTC)							
T-1	15.47 ± .140	16.35 ± .676	.503 [−.210, 1.22]	.165	<i>F</i> = .500	<i>F</i> = 2.037	
T-2	15.72 ± .632	15.84 ± .155	−.244 [−1.00, .511]	.523	<i>p</i> = .489	<i>p</i> = .157	
Risk factors							
Emotional distress (SDQ subscale)							
T-1	1.02 ± .224	.981 ± .211	.039 [−.65, .57]	.880	<i>F</i> = .043	<i>F</i> = .330	
T-2	.876 ± .186	1.01 ± .178	.145 [−.56, .29]	.518	<i>p</i> = .837	<i>p</i> = .567	
Peer problems (SDQ subscale)							
T-1	1.11 ± .221	1.38 ± .235	.274 [−.91, .37]	.804	<i>F</i> = 1.005	<i>F</i> = .060	
T-2	1.15 ± .229	1.49 ± .241	.334 [−.99, .32]	.566	<i>p</i> = .318	<i>p</i> = .806	
Inattention/hyperactivity (SDQ subscale)							
T-1	3.71 ± .411	2.96 ± .386	−.751 [−1.87, .37]	.186	<i>F</i> = 1.531	<i>F</i> = .212	
T-2	3.39 ± .417	2.84 ± .396	−.556 [−.59, 1.68]	.336	<i>p</i> = .219	<i>p</i> = .647	
Conduct problems (SDQ subscale)							
T-1	1.51 ± .607	1.36 ± .636	−.158 [1.29, .98]	.784	<i>F</i> = .120	<i>F</i> = .001	
T-2	1.41 ± .610	1.24 ± .643	−.181 [−1.34, .98]	.757	<i>p</i> = .730	<i>p</i> = .970	

Note. HLM = hierarchical linear model; SE = standard error; CI = confidence interval; YCI = youth coping index; SDQ = Strengths and Difficulties Questionnaire. ****p* < .001. **p* < .05.

Discussion and Applications to Social Work

This study hypothesized that participation in the JoH intervention would decrease risk factors and improve protective factors and positive coping skills for children to a greater degree than those in the wait-list control group. As hypothesized, participation in the JoH showed a statistically significant treatment interaction for increased coping and prosocial behaviors.

Although all measures did not reach statistical significance from pre- to posttest for the treatment group, the results of this study have implications for future application and adaptation of the JoH. First, coping and prosocial behaviors were statistically significant and had moderate effect sizes that suggested improvement in protective outcome measures. Considering the intervention seeks to help build protective factors to reduce risk of both current and future mental health and psychological symptoms, the findings confirm previous studies related to children's experiences of disasters. For example, previous studies have shown, children with healthy coping skills (e.g., positive thinking, acceptance, emotional expression) and positive protective mechanisms (e.g., positive peer and adult relationships, social support, health school environment) have an increased capacity to overcome the adversity of a disaster (Lengua et al., 2006; Masten & Obradovic, 2006; Stevenson & Zimmerman, 2005; Wadsworth et al., 2009). The outcomes of this study indicate the JoH may be one mechanism to help build those abilities with the general population of children affected by a disaster.

Interestingly, none of the risk indicators showed significance or had a meaningful effect on the various outcomes. It

is likely that the individual reporting on the measures (child or teacher report) is one possibility for the difference in outcomes. Teachers reported risk factors; therefore, they may not have been as sensitive as self-reports by the children themselves. It should be noted that in future studies, measures on all indicators should be completed by both teachers and the youth.

Another consideration is that all three of the schools that took part in the study had at least 80% of their students on free and reduced lunch; this is an indication that most of the participants came from low socioeconomic status neighborhoods. As previous studies indicate (Fothergill & Peek, 2004; Zakour & Harrell, 2003), children who live in poverty are at a higher risk for mental health issues than their peers in more affluent neighborhoods, even without experiencing a disaster. Coupled with disaster exposure, children in impoverished neighborhoods are at higher risk for behaviors such as conduct issues, peer problems, and emotional distress (Fairbank & Fairbank, 2009; McLaughlin et al., 2009; Sapienza & Masten, 2011). Considering the dual risk of poverty and disaster exposure, further curriculum development must take into account that the JoH may be appropriate in reducing risk among children who have not only experienced a disaster, but also live in chronic poverty.

Study Limitations

Although significant differences were found between experimental and control groups concerning coping and prosocial

behaviors, several limitations must be noted. First, given that the study employed a wait-list control design, contamination of the control group is a methodological concern. Many of the wait-listed children had direct interaction with those who were in the experimental group; therefore, they had knowledge of the activities and topics discussed in the program during the study period which may have impacted their self-report measures. Additionally, the teachers' report for prosocial attitudes, emotional distress, inattention/hyperactivity, peer problems, and conduct problems (SDQ measure) was completed by teachers who were aware which participants were in the JoH group versus those who did not participate in the intervention. Therefore, the teachers may have given more attention to changes in behavior among those who participated in the JoH than among children in the control condition.

Significant differences between intervention and control group were also found at baseline (JoH group scored significantly lower on coping and subscales of the SDQ). This was an unforeseen issue that may be explained by the difference of disaster exposure among the students in the various schools. While all the children in Tuscaloosa were affected, some were displaced from their schools while others did not have that disruption. Another reason for differences between the JoH group and wait-list control may have been due to a selection bias from teachers and social workers. Although they were instructed to refer a mix of children to each group, it is possible the teachers and social workers recommended students they viewed as most in need to the initial JoH group. Despite the likelihood that children who participated in the JoH were more traumatized than the control due to their exposure to the tornado, the intervention appeared to be effective in returning children to a normal level of coping and prosocial behaviors.

The challenges associated with conducting research in real-world settings such as schools has been well documented (Weisz, Sandler, Durlak, & Anton, 2005; Proctor et al., 2009). The inability to assign students randomly to groups due to logistical barriers prohibited the use of equivalent groups design. The sample selection process was created in partnership with the school system, which was essential to successful implementation of the program. However, procedures required teacher interaction in the sample assignment protocol that seemed to have resulted in non-equivalent groups. Thus, the significant improvement on coping and prosocial behaviors at posttest among the intervention group suggests that the JoH intervention was effective, though possibly underestimated in this study.

The small sample was another methodological constraint in this study. Given the time of the study, and that many schools were still in the process of re-opening, it was difficult to obtain parental consent and school collaborators months after the tornado struck Tuscaloosa. This limitation is common in postdisaster research, as communities are often in the process of rebuilding and continue in a state of disorganization (Bonanno, Brewin, Kaniasty, & La Greca, 2010). Another difficulty was finding sensitive and accurate measures to appropriately assess coping skills and overall difficulties among children who have

experienced a disaster (Roberts & Everly, 2006). While there are a number of validated post-traumatic stress scales, there are few that measure other disaster related symptoms, such as post-disaster coping, peer relations, or more generalized difficulties (Roberts & Everly, 2006).

Clinical Significance

Despite the limited findings of this study, there are a number of clinical implications that can be drawn. First, there are very few evidence-based broadly accessible interventions available to children after a disaster (Silverman et al., 2008), and many focus on children who are exhibiting post-traumatic stress symptoms. Many children will not be diagnosed with PTSD, but experience a host of other stressors related to the disaster (Evans & Oehler-Stinnett, 2006; Jaycox et al., 2006; Kataoka et al., 2003; Liu et al., 2011). Considering children who directly experience a disaster are at a higher risk for a variety of future mental health issues, it is important to make programming available that addresses their social and emotional needs. Addressing these needs may, in turn, increase resilience and reduce risk in the aggregate of young people who were affected by the trauma. This study illustrates that a broad-based intervention delivered in the schools can assist children build coping skills and enhance protective factors following a major traumatic event.

This study also has implications for promising practices that may be delivered under the National Disaster Recovery Framework (NDRF). The NDRF framework addresses six central support functions which aid in postdisaster recovery including community planning, economic, health and social services, housing, infrastructure, and natural and cultural resources (FEMA, 2014). Findings from this study lend to the health and social services recovery support mission to "assist locally-led recovery efforts in the restoration of the public health, health care and social services networks to promote the resilience, health and well-being of affected individuals and communities" (FEMA, 2011, p. 1). After a disaster, it is essential for social workers and other mental health professionals to keep this guiding document in mind because it may help aid in service provision to meet the needs of disaster survivors. Moreover, the JoH directly supports the NRDF because it is one approach that may aid in recovery and resilience of children and adolescents who have been impacted by a traumatic event.

The outcomes of this study provide the foundation for future research on the topic of school-based postdisaster interventions. Two previous studies have been conducted using the JoH intervention in a postdisaster setting. The first study was a qualitative design conducted in New Orleans after Hurricane Katrina; the second was a pre-post single group design that was conducted in Christchurch New Zealand after an earthquake (Blanchet-Cohen & Nelems, 2013; Powell, 2011). As this study is the first to use a quasi-experimental design to evaluate the JoH, future replication studies with larger samples in other communities impacted by a disaster are needed to develop further understanding of how JoH enhances coping and builds

resilience in children. Since 2010, over 450 million people have been impacted by natural disasters (International Monetary Fund, 2012), and recent trends and predictions indicate that these disasters will continue to increase (Gall, Borden, Emrich, & Cutter, 2011). Given these trends, it is important to have broadly accessible and relatively inexpensive programs to help children cope with and overcome these traumatic events.

Declaration of Conflicting Interests

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