



Support for Students Exposed to Trauma (SSET) Program: An Approach for Building Resilience and Social Support Among Flood-Impacted Children

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Abstract

The present study is a pilot study to examine the initial effectiveness of the Support for Students Exposed to Trauma (SSET) program (Jaycox et al. in *Support for Students Exposed to Trauma: the SSET program. Lesson plans, worksheets, and materials. TR-675, RAND, Santa Monica, CA, 2009*) in reducing PTSD symptoms and building resilience and social support among children living in flood-affected rural areas of Southern Punjab, Pakistan. One hundred and ninety-three children were screened for symptoms of post-traumatic stress, and 38% met eligibility criteria. Children were then randomly assigned into experimental ($n = 38$) and control ($n = 37$) groups. The findings of the study showed a significant reduction in PTSD symptoms, and improvement in resilience, and perceived social support in the experimental group. The result of the study demonstrates that SSET, delivered by a clinically trained provider, may be an effective intervention for treating traumatic stress symptoms among children affected by natural disasters like flooding, particularly in under-resourced contexts. This pilot lays the initial groundwork for SSET in this context, which may ultimately be implemented by non-clinicians to address trauma-related psychological issues.

Keywords Trauma interventions · School mental health · PTSD · Resilience · Social support · Children

Introduction

The frequency of natural disasters and the intensity of the subsequent loss and destruction experienced by individuals and communities across the world are increasing (Alston,

Hazeleger, & Hargreaves, 2019). The Centre for Research on the Epidemiology of Disasters (CRED) has recorded 6873 natural disasters across the world during a twenty-year period (1994–2013) which has resulted in a loss of 1.35 million human lives (Wallemacq, Herden, & House, 2015). In 2018 alone, 315 natural disasters affected more than 68 million people worldwide and lead to the loss of 11,804 lives and financial losses of \$131.7 billion (CRED, 2019). In the wake of a natural disaster, people can experience life-threatening traumatic events and disaster-related stressors (Weems, Russell, Neill, & McCurdy, 2019), which may lead to long-term adverse consequences for children and adolescents, including poor educational performance, substance use, mental and physical health issues (Lieberman & DeMartino, 2006; Weissbecker, Sephton, Martin & Simpson, 2008).

The high rate of exposure to traumatic events among children makes trauma one of the major public health problems in the world (Tang, Deng, Glik, Dong, & Zhang, 2017). Between 30.6 and 43.9% of children and adolescents have been reported to develop PTSD following natural disasters in the Indian subcontinent and in China, respectively (Kar

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et al., 2007; Tang et al., 2017). Children and young people are among the most vulnerable to the physical and psychological impacts of natural disasters (National Commission on Children and Disasters, 2010). Because they have fewer skills, experiences, and resources to cope with psychological distress associated with natural disasters as compared to adults, their ability to thrive over the short and long term may be affected (Garrett et al., 2007; Masten & Osofsky, 2010). Moreover, those with severe exposure to traumatic events show elevated internalizing and post-traumatic stress symptoms relative to those who witness violence and have more moderate exposure (Hagan, Sulik, & Leiberman, 2016). Common mental health symptoms associated with traumatic events of natural disasters include post-traumatic stress disorder (PTSD), depression, and anxiety (Kousky, 2016; Self-Brown, Lai, Thompson, McGill, & Kelly, 2013).

Flood Impact in Rural Pakistan

The current study empirically examines the psychosocial outcomes of school-based trauma services provided to the children located in flood-affected rural areas of Pakistan. Children and families in these areas are more likely to experience traumatic stress due to high rates of living in poverty, increased unemployment rate, low educational opportunity, and lack of health services (Ghous, Khan, & Basit, 2015; Roche, 2015). Families in rural communities are also less likely to receive rehabilitation, treatment, and counselling assistance to cope with mental and behavioral health problems, largely due to lack of mental health professionals (Howell & McFeeters, 2008). Given the lack of access to mental health services, schools serve as a useful platform for providing health and wellness services and increasing students' capacity to learn in the classroom (Larson & Halfon, 2010), particularly for those exposed to traumatic events (Kataoka, Langley, Wong, Baweja, & Stein, 2012).

In Pakistan, large rainstorms mark the season from July to September, and the country is currently ranked 9th out of 162 nations affected by floods (Bhamani et al., 2012; Zuberi, 2014). In fact, between the years of 2010 and 2013, Pakistan was ranked between the 1st and 6th position on a list of the most flood-affected countries (Federal Flood Commission, 2012; Mustafa & Wrathall, 2011). The most commonly affected areas in the country include districts within the provinces of Punjab, Azad Jammu and Kashmir, Gilgit-Baltistan, Khyber Pakhtunkhwa and Sindh (National Disaster Management Authority [NDMA], 2014). The high level of flood risk exacerbates the poor educational outcomes and health status among a population that is already impoverished (Ghous et al., 2015; Parvin, Shimi, Shaw, & Biswas, 2016). According to the Pakistan Economic Survey (2014–2015), Pakistan has lost more than three thousand lives and \$16 billion due to the flood surges in 2010 and

2012. Floods affected more than 10,000 schools in Pakistan, among which 82% were damaged completely and 18% were partially damaged (Roche, 2015). As a result, approximately 1.5–2.5 million children were either out of school or missed the beginning of their academic year. This lack of access to education may debilitate children's intellectual, physical and emotional growth and even impair national growth (Khuwaja, 2010). Yet in critical times, families still seek connection as well as support and receive essential services from schools.

Due to the potentially disastrous consequences of floods, it is critical to pay attention to the patterns of post-traumatic stress, anxiety, and depression symptoms among flood-affected children (Lai, Kelley, Harrison, Thompson, & Self-Brown, 2015). Hence, the goal of the current study is to examine the effects of a school-based trauma intervention on the symptoms of post-traumatic stress disorder (PTSD) and resiliency among school children of flood-affected areas. A study of flood-affected adolescents found that exposure to the death of family members, loss of property, and related social and economic misfortunes were all positively associated with traumatic stress symptoms (Fu et al., 2013; Ziaad-dini, Nakhuae, & Behzadi, 2009). Yet, recognizing that not all exposed individuals will suffer from ongoing traumatic stress symptoms, the study also focuses on the development of individual and community-based resilience and social support from parents and peers, which has been related to a lower likelihood of developing mental health symptoms among flood-affected children (Lai et al., 2015).

Evidence-Based Trauma Interventions in Schools

There has been research indicating that those with symptoms of PTSD benefit from early intervention and there is empirical support for cognitive-behavioral interventions as effective for addressing symptoms of post-traumatic stress disorder in children (Cohen, Mannarino, Zhitova, & Capone, 2003; Jaycox et al., 2002; Kataoka et al., 2003; Stein et al., 2003). The Cognitive Behavioral Intervention for Trauma in Schools (CBITS) is one intervention designed for delivery in schools for students that may or may not have a formal diagnosis of PTSD but who are exhibiting clear symptoms (Stein et al., 2003). CBITS was developed through a community-research partnership to address post-traumatic stress symptoms due to community violence, disasters, and other traumatic experiences experienced by a large number of children and adolescents in the US (e.g., Kataoka et al., 2003; Stein et al., 2003). CBITS consists of 10 group therapy sessions and 1–3 individual sessions delivered in schools that are aimed at reducing a child's post-traumatic stress symptoms and enhancing their skills to handle future stressors (Jaycox et al., 2010). CBITS has been successfully implemented in schools across the US (Langley, Nadeem, Kataoka, Stein, &

Jaycox, 2010; Nadeem, Jaycox, Kataoka, Langley, & Stein, 2011; Walker, 2008) and has been used in post-disaster contexts for ameliorating symptoms of PTSD and depression (Jaycox et al., 2010; Kataoka et al., 2009; Stein et al., 2003). There is also evidence of a positive impact on students' school performance (Kataoka et al., 2003).

Unfortunately, a large number of schools lack access to mental health professionals and require the involvement of non-clinicians to provide mental health assistance at large scale. This is particularly true in schools located in the flood-affected areas of Pakistan. Support for Students Exposed to Trauma (SSET) is an adaptation of CBITS that can be delivered by non-clinical professionals as an early intervention for traumatic stress symptoms (Jaycox, Langley, & Dean, 2009; Jaycox, Langley, Stein et al., 2009). Key adaptations included the use of lessons aligned with school curricula instead of clinical sessions, the exclusion of individual sessions with a clinical trauma narrative, and limited caregiver sessions (Jaycox, Langley, & Dean, 2009; Jaycox, Langley, Stein et al., 2009). A randomized pilot study of SSET showed that children with the most severe PTSD scores experienced a significant decline in their PTSD symptoms and classroom teachers reported a change in children's externalizing behaviors (Jaycox, Langley, Stein et al., 2009). In the current pilot study of SSET in Pakistan, SSET was delivered by a clinically trained provider as a critical first step in the event there was a need to tailor it further to the local implementation context. If the intervention showed promise, it could be expanded to the teachers and other non-clinicians.

Apart from improving PTSD symptoms, a secondary goal of an early intervention program like SSET is to foster resilience, particularly among children who are consistently exposed to stressors. Resilience refers to an individuals' capacity to overcome adversity and perform well even in the face of further exposure to adversity (Cicchetti, 2013; Liebenberg, Ungar, & Vijver, 2012; Liebenberg, Ungar, & LeBlanc, 2013; Luthar, 2006; Masten, 2001; Rutter, 2000; Ungar, 2008). The APA (2015) defines resilience as a person's ability to adjust well in difficult experiences (such as family and relationship problems, serious health problems or workplace and financial stressors). The individual capacities related to resilience include forming attachments, self-regulation, cognitive skills, maintaining relationships with family and friends, and the ability to acquire community resources and opportunities (education, health, recreation, and social service) (Luthar, 2006; Masten, 1999; Ungar, 2011). While negative life events experienced in childhood contribute to the risk for developing psychopathology (Cicchetti, 2013), many 'high risk' children do not exhibit PTSD symptoms and performed surprisingly well in their daily routine buoyed by their resiliency factors (Evans, Li, & Whipple, 2013; Masten, 2013). An early intervention, like SSET, seeks to identify and support students often before

they seek support from clinical providers. As such, the intervention may foster resiliency skills among the flood-affected children by helping them to connect with their peers, trusted adults, and family members as well as social connections that may foster resilience (Bishop, 2015). In addition, because resilience is thought to a capability that emerges from a set of acquirable behaviors, thoughts, and actions (Kalisch et al., 2017), SSET components may also foster resiliency skills. For instance, social problem-solving focuses on current and future stressors. SSET provides a framework for how students can address overwhelming emotions, and students proactively learn to address unhelpful or maladaptive cognitions that arise in daily life.

Present Study

The current study aims to assess the effectiveness of SSET in reducing traumatic stress and related internalizing symptoms in children exposed to a natural disaster. We conducted this study in rural areas of Pakistan, which have faced a severe lack of mental health services over the past 70 years (Abbasi & Shaukat, 2012). As noted above, because of the novel and severely under-resourced and under-studied implementation context, SSET was delivered by clinically trained personnel with the direct support of non-clinical staff. Hence, the major objective was to conduct an initial pilot test of SSET's potential in a rural South Asian community and examine the interventions' ability to lessen the symptoms of PTSD and build resilience through children's family, peers and school support systems. The primary hypothesis of the present study is that children who receive SSET will show a reduction in PTSD symptoms and an increase in resilience and perceived support as compared to the students who did not receive the intervention. A secondary study goal is to lay a foundation for further dissemination to non-clinical school personnel.

Method

Study Context

The present study was conducted in August 2015 to February 2016 in the flood-affected rural areas of Multan in southern Punjab, Pakistan. As discussed earlier, disaster-impacted rural areas of Pakistan have a dearth of major health and mental health services. The SSET program was chosen because of its promise for use by non-clinicians in low-resource settings. However, in this study, a practitioner with a clinical background delivered SSET. The person was supported by local school teachers who were present to support the group process. This decision was made because this was the first effort of its type in the region. There was a need

to develop implementation and training protocols tailored to the region and its future non-clinical implementers, and there could be a potential need for further adaptation.

Although SSET was developed for use by non-clinicians, it has largely been used in developed countries (e.g., US) where teachers are more likely to have some background in behavioral support and social-emotional issues and access to institutional support structures. Several states and school districts have developed teacher training materials focused on social-emotional learning and trauma awareness (e.g., Wisconsin, Washington) and the American Federation of Teachers has focused on trauma awareness in the latest issue of the American Educator (Darling-Hammond & Bransford, 2007; Jennings, 2019; Jones & Bouffard, 2012; Yager, 2011). Hence, it may be reasonable to presume that teachers in the US likely have greater readiness for addressing mental health and trauma than those in Pakistan.

Participants and Procedure

There were different steps involved in carrying out study. First, the researchers reviewed the literature to identify evidence-based interventions for trauma delivered in schools. This step concluded with the selection of Support for Students Exposed to Trauma (SSET) as the most feasible and potentially sustainable option for two important reasons: the program design, and the goal of ultimate delivery by professionals without mental health training.

In the next step, the forward and backward language translation method was applied to prepare the scales for study implementation (e.g., Beaton, Bombardier, Guilemin, & Ferraz, 2000). This included the Child Revised Impact of Events Scale-13 (CRIES-13; Perrin, Meiser-Stedman, & Smith, 2005), the Child PTSD symptom Scale (CPSS; Foa, Johnson, Feeny, & Treadwell, 2001) and Child and Adolescent Social Support Measure (CASSS; Malecki, Demaray, Elliot, & Nolten, 1999). The language translation process was carried out with the help of academics (5 educators and 5 psychologists) to guide the translation, assess the face validity of the items, and to examine if the questionnaire items had cultural relevance in Pakistan. This process involved the translation of questionnaire items into Urdu, checking for the consistency of meaning with the original questionnaire items, and then re-translation of responses back into English to affirm that no information or context was lost. The translated measures were then piloted with 30 students from a flood-affected area in order to obtain feedback on whether the items were understandable. The school used for piloting was not included in the schools sampled for this study. The reliability (Cronbach's alpha coefficient, split-half reliability) and validity (cross-language validity) were also tested. The study used an existing translated version (Pervaiz & Naz, 2013) of the resiliency measure, the

Child and Youth Resilience Measure (CYRM-28; Ungar & Liebenberg, 2009).

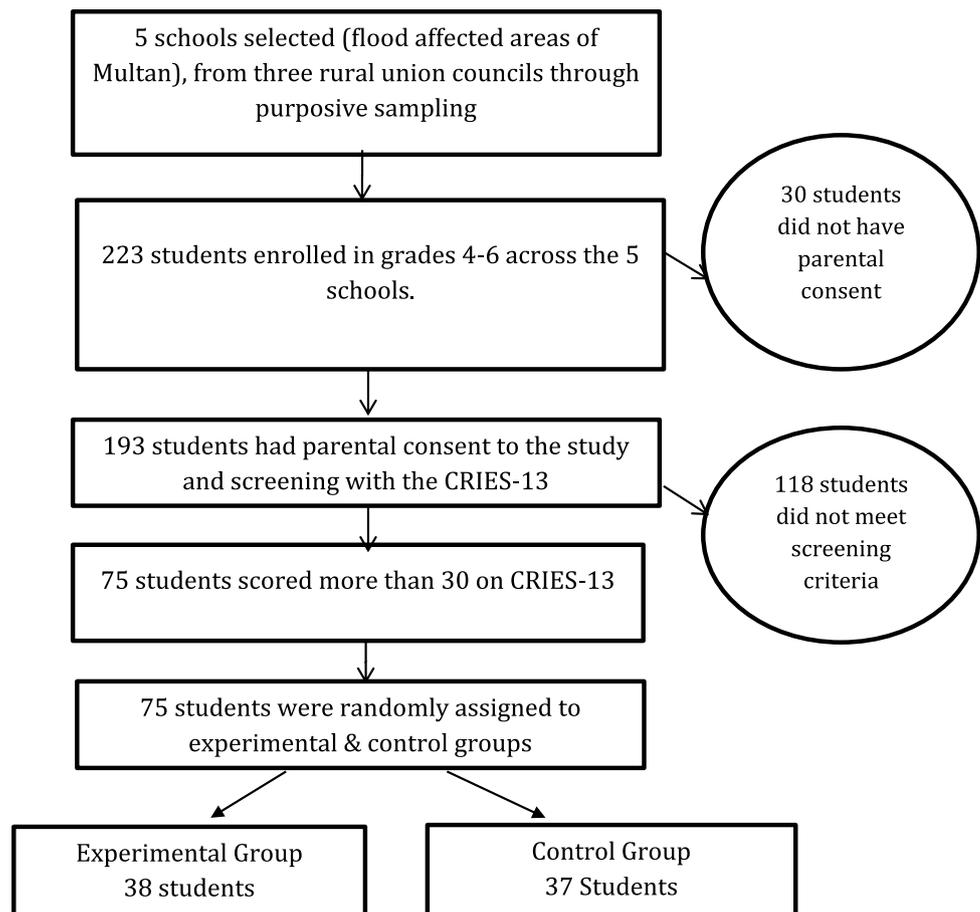
Participants of this study were selected from 5 public sector elementary schools located in three rural union councils (85-Band Bosan, 92-Nawab Pur, and 96-Sher Shah). These union councils are situated in the flood-affected area of district Multan, Southern Punjab, Pakistan. Those schools were targeted based on their location near the river line. The participants were selected through a purposive sampling technique (see Fig. 1). The total number of students enrolled in these schools in grades 4–6 was 223.

The recruitment of students started with a parent-teacher meeting organized by the researchers before the commencement of data collection. The parents of all 223 students were called for this meeting. Researchers sent invitations and consent forms to the parents through their children enrolled in the schools. The consent forms described each step of the research such as screening, random assignment, and the assessments. Particularly, the consent explained that if eligible for the intervention, their child may be assigned randomly to receive the treatment or to be part of a no-treatment control group. The parents were asked to provide consent to participate in both the screening and in the intervention study. Out of 223, parents of 193 students (86%) provided their written consent.

After consent, the researchers screened students for post-traumatic symptoms using the Children's Revised Impact of Event Scale (CRIES-13; Perrin et al., 2005). Participants scores on CRIES-13 (Perrin et al., 2005) ranged from 4 to 65 ($M = 32.33$; $SD = 13.88$). Screening results indicated that 75 (38%) students out 193 scored above the clinical cutoff (≥ 30). According to Perrin et al. (2005), scores at or above 30 are indicative of the presence of post-traumatic stress symptoms in children in both clinical and at-risk samples. We used this cutoff score in the present study because various validation studies in both developed as well as developing countries used the same cutoff score (e.g., Deeba, Rapee, & Prvan, 2014), in the present study. Of note, because the study team determined that there was lower acceptability among members of local community with asking about a broad range of traumatic events, the screening focused directly on flood exposure.

The researchers scheduled parent meetings for each student who screened positive on the CRIES-13. This meeting was held to share the CRIES-13 scores of eligible students with their parents and debrief them again about the purpose of research and study procedures regarding randomization. The final sample consisted of 75 students (49 boys and 26 girls) with an average age of 11.43 years (range 7–13 years) who were then randomly assigned to the intervention and control groups within each school (one intervention and one control group in each school). These students were enrolled in grades 4–6 and were evenly distributed across the five

Fig. 1 Study flow chart



schools (School 1: $n = 15$, 20%; School 2: $n = 16$, 21.3%; School 3: $n = 12$, 16%; School 4: $n = 14$, 18.7%; School 5: $n = 18$, 24.0%).

Research team members blind to study conditions administered all baseline and post-intervention measures via paper and pencil to participants in both study groups. Baseline measures were given prior to randomization. Students in the intervention group were provided the SSET program lessons over a period of 12 weeks, while students in the control group received no intervention. As noted above, local school teachers served as co-facilitators during the intervention in order to support the group but did not lead the lessons. The post-test occurred just after the completion of the intervention.

The researchers delivered SSET to the experimental group during the zero period. In Pakistan, the term “zero period” refers to a class period that occurs before the normal school-day commences. Typically, “zero period” is used as a morning “recess” in which students engage in either playing outside, talking with their friends, or doing their leftover schoolwork. The students participating in the experimental group were asked to participate in SSET during “zero period” before the commencement of the formal school day. Students in the control group were engaged in their routine

activities (e.g., playing outside, engaging with friends, doing school-related work) like other students who were not the part of the study.

Intervention

Support for Students Exposed to Trauma (SSET) is a school-based intervention program for students who have been exposed to traumatic events and exhibit signs of post-traumatic stress disorder (PTSD) (Jaycox, Langley, & Dean, 2009; Jaycox, Langley, Stein et al., 2009). Specifically designed for delivery by teachers, school counsellors, and other non-clinical staff, SSET is an adaptation of the Cognitive Behavioural Intervention for Trauma in Schools (CBITS) Program. Like CBITS, SSET program is a series of 10 structured lessons designed to reduce post-traumatic and depressive symptoms and improve functioning in school children exposed to traumatic events. SSET includes many components of CBITS, including, psychoeducation, relaxation, cognitive restructuring, behavioral exposure, and social problem-solving. After review by the research team and community stakeholders (school principals), SSET was considered to be more acceptable and feasible than a more overtly clinical intervention like CBITS. However, as noted

above, it was determined because this was the first such effort of its kind in the region that the intervention should first be delivered by someone with a clinical background that could implement it with fidelity and determine if further adaptation was needed.

The community and research partners determined that the SSET program could be delivered as it was designed with two changes: (1) language adaptation to Urdu, Punjabi, and Siraiki (the local language in Southern Punjab), and (2) regular parental contact. Specifically, the clinician delivered the lessons in a colloquial mix of the languages that represent how families speak locally. For students receiving SSET, parent meetings were held approximately monthly to align SSET implementation with the collectivist cultural context in Pakistan. In total, four parent meetings were held during school hours. During these meetings, the clinician and co-facilitator provided psychoeducation on common reactions to trauma and mental health, obtained feedback from parents on how their children were doing in the program, and enlisted parental help. This included parental help in performing practice activity assignments, ensuring group attendance, and monitor progress on SSET practice assignments weekly. Each student's mother attended each of the offered parent sessions.

SSET student group lessons were delivered once weekly for 45 min to the students of treatment group in each elementary school. The group size ranged from 6 to 9 students per group, as the intervention was provided to the students of treatment group only (please consult Table 1 for the summary of SSET program components). This group size is in line with the recommended SSET group size of 6–10 students (Jaycox, Langley, & Dean, 2009; Jaycox, Langley, Stein et al., 2009), which the local implementers determined was feasible. All the participants in the intervention group attended all 10 sessions.

Table 1 Components of the SSET program

Lesson number	Lesson content
One	Introduction to SSET and to cognitive behavioral theory
Two	Psychoeducation: common reactions to trauma Relaxation: strategies for relaxation
Three	Cognitive restructuring: thoughts and feelings
Four	Cognitive restructuring: helpful thinking
Five	Real life exposure: facing your fears
Six	Exposure to trauma memory: trauma narrative, part one
Seven	Exposure to trauma memory: trauma narrative, part two
Eight	Problem solving
Nine	Practice with social problems and the Hot Seat
Ten	Planning for the future and graduation

Although the intervention was led by a clinically trained person, there were five co-facilitators (one per school). After selection of schools, researchers met with principals and teachers to build collaboration and discuss the study's purpose and logistics. Schools in rural Punjab are typically staffed with three to four teachers and two staff that are not necessarily trained in education. Teachers volunteered to perform the role of SSET co-facilitators in the study. Each co-facilitator received a brief, in-person training prior to the start of the intervention about the SSET consent and their role in supporting the group. Additional meetings were held as needed. The age of co-facilitators varied from 24 to 35 years ($M = 29.0$; $SD = 4.06$). Three co-facilitators were females while two were male. All co-facilitators had master level qualification and a bachelor's degree in education. In each school, the group co-facilitator was also a grade-level teacher (two taught 5th grade, two taught 6th grade and one taught 4th grade). The co-facilitators assisted in all of SSET lessons as well as the parent meetings (held once in a month). There was no incentive or compensation for their weekly participation.

Fidelity to SSET was supported through the supervision of the lead clinician. Because it was not deemed acceptable by the school or parent community to record sessions, it was not possible to conduct fidelity ratings of video or audio recordings. There was live observation of the group leader by the lead author during each of the 10 sessions during the first group. After this, the group leader met weekly with the study's lead author in order to review sessions and support fidelity by reviewing each of the sessions components and discussing whether it was delivered, how students were engaged in the process, and if there were any challenges and successes.

In addition, informal information about the acceptability of the intervention was gathered from co-facilitators through a very brief written survey. Each of the five co-facilitators responded in the affirmative to a question about whether they would recommend SSET for others. Written comments indicated that all co-facilitators considered the intervention to be useful and effective in improving student behavior. Several of the co-facilitators also indicated that they felt the skills would be applicable to parents and other adults in the community.

Measures

Demographics

Demographic characteristics of the participants included age, gender, and socioeconomic status (measured through the monthly income of the family as proposed in the 2016–2017 budget by the Pakistan finance ministry). Under this guidance, a person who has less than 12,000 Pakistani

Rupees (PKR) monthly income is considered to be in a low-income category; a person having monthly income of 13,000–75,000 PKR is considered to be middle class, and a person who has a monthly income of more than 75,000 PKR is considered to be upper class. Demographics also included an indicator of “family system”, which is categorized as nuclear (residing unit of the participant either his family consisted of his parents and siblings only), or joint family (living with parents and/or paternal or maternal grandparents along with uncle and aunts). Moreover, parental education; primary (grade 1–5), middle (grade 6–8), matric (9th and 10th), intermediate (grade 11–12th), and Bachelor’s degree, was included in the demographics.

Screening

The Child Impact of Event Scale-Revised (CRIES-13; Perrin et al., 2005) is a 13-item measure that was used to assess the presence of post-traumatic stress symptoms among children in flood-impacted areas. It is comprised of 3 subscales; Intrusion (4 items), Avoidance (4 items) and Arousal (5 items). Items were rated on a four-point non-linear scale ranging from not at all (0), rarely (1), sometimes (3) and often (5) and added to obtain a total score. Cutoff scores of 30 or above are considered to be clinically significant symptoms according to the scale developers, and warrant further assessment (Perrin et al., 2005). In the current study, Urdu translated versions were used (Komal, 2016). Cronbach’s Alpha, test–retest and split-half reliability of Urdu translated version is as follows: $\alpha = 0.90$; 0.81; 0.73.

Outcome Measures

The following outcome measures were used in the present study.

Post-traumatic Stress Symptoms The researchers used 27-item Child PTSD symptoms Scale-V (CPSS-V-SR; Foa et al., 2001) for measuring post-traumatic stress symptoms. Twenty items assessed PTSD symptoms (re-experiencing, avoidance, cognition and mood, and hyper-arousal) and were rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (6 or more times a week). The remaining items assessed functional impairment using a yes/no response category. The Urdu version of CPSS-5-SR (Iqbal, 2015) was used in the study. The values of Cronbach’s Alpha, test–retest, and split-half reliability of CPSS-V, Urdu translated version are 0.89, 0.88, and 0.79, respectively.

Resilience The researchers assessed the capacity for resilience among children using Child and Youth Resilience Measure (CYRM-28) developed by Ungar and Liebenberg (2009). CYRM-28 is a multi-dimensional measure consist-

ing of 28 items, yielding three sub-dimensions. The dimensions include: individual capacities (e.g., “I have people I look up to”), relational capacities (e.g., “my caregiver watches me closely”), and contextual capacities (e.g., “I feel supported by my friends”). Items are rated on a 5-point Likert scale ranging from one (*not at all*) to five (*a lot*). A high score on the scale indicates higher resilience. This study used the Urdu version of CYRM-28 (Pervaiz & Naz, 2013). Internal consistency (Cronbach alpha), test–retest reliability, and split-half reliability of the Urdu version are 0.92, 0.85, and 0.80, respectively.

Social Support Due to the potential of SSET to foster social support among students, the self-rating measure of Child and Adolescent Social Support Scale (CASSS; Malecki et al., 1999) was used to assess the students’ perceptions of support from parents, teachers, and classmates. The CASSS is a 60-item self-report rating scale that consists of three sub-dimensions: parental support (e.g., “Show they are proud of me”), teacher support (e.g., “Cares about me”), and peer support (e.g., “Treat me nicely”). Each sub-dimension was comprised of 12 items. The responses were obtained on a 5-point rating scale ranging from one (*never*) to six (*always*). The higher scores represent higher perceived support. The values of internal consistency (Cronbach alpha), test–retest reliability, and split-half reliability of the Urdu version are 0.87, 0.88, and 0.75, respectively.

Statistical Analysis

Statistical analysis was conducted using SPSS. The present study involved two groups of students (control group and experimental group) whose PTSD symptoms, resilience, and social support were measured at two different times, Time 1 (pre-test) and Time 2 (post-test). Hence the study design was classified as a ‘mixed between-within subjects analysis of variance’ (Pallant, 2007; Tabachnick & Fidell, 2007). This technique is also known as a ‘split-plot’ ANOVA design (SPANOVA), which assessed the interaction effect of time and intervention on the outcome variable. Additional analyses were also conducted to determine whether intervention effects varied after accounting for key demographic covariates.

Results

Descriptive Statistics

Table 2 describes the participant’s characteristics by treatment assignment. Participants had a mean age of 11.43 years ($SD = 1.44$). Sixty-five percent of the sample was male ($n = 49$) and thirty-five percent ($n = 26$) was

Table 2 Demographics characteristics of participants by intervention and control group

	Total (<i>n</i> = 75)				Intervention (<i>n</i> = 38)				Control (<i>n</i> = 37)			
	Mean	(SD)	<i>N</i>	(%)	Mean	(SD)	<i>N</i>	(%)	Mean	(SD)	<i>N</i>	(%)
Age (years)	11.43	(1.44)			11.29	(1.48)			11.57	(1.41)		
Gender												
Male			49	(65.3)			28	(73.7)			21	(56.8)
Female			26	(34.7)			10	(26.3)			16	(43.2)
School												
1			15	(20)			8	(21.1)			7	(18.9)
2			16	(20)			8	(21.1)			8	(21.6)
3			12	(16)			6	(15.8)			6	(16.2)
4			14	(18.7)			7	(18.4)			7	(18.9)
5			18	(24.0)			9	(23.7)			9	(24.3)
Grade												
4			18	(24.0)			11	(28.9)			7	(18.9)
5			29	(38.7)			14	(36.8)			15	(40.5)
6			28	(37.3)			13	(34.2)			15	(40.5)
Socioeconomic status												
Low			63	(84)			34	(89.5)			29	(78.4)
Middle			12	(16)			4	(10.5)			8	(21.6)
Family system												
Nuclear			37	(49.3)			20	(52.6)			18	(48.6)
Joint			38	(50.7)			18	(48.4)			19	(51.4)
Father's education												
Primary			24	(32)			14	(36.8)			10	(27)
Middle			24	(32)			11	(28.9)			13	(35.1)
Metric			15	(20)			10	(26.3)			5	(13.5)
Intermediate			8	(10.7)			2	(5.3)			6	(16.2)
Graduate			2	(2.7)			1	(2.6)			1	(2.7)
Masters			2	(2.6)			–	–			2	(5.1)
Mother's education												
Primary			37	(49.3)			20	52.6			17	(45.9)
Middle			25	(33.3)			14	36.8			11	(29.7)
Metric			7	(9.3)			2	5.3			5	(13.5)
Intermediate			5	(6.7)			2	5.3			3	(8.1)
Graduate			1	(1.3)			0	0			1	(2.7)
Masters			–	–			–	–			–	–

SD = standard deviation; *n* = number of participants in a group; % = percentage of participants in a group

female. The largest numbers of students were in fifth grade (38.7%). The majority of participants were classified as having low socioeconomic status (84%). The largest proportion of fathers had primary education or middle school education (38% in each category). Almost half of the mothers had primary education. There were no significant differences in demographic characteristics or baseline outcome measures between the intervention and control groups.

Impact of SSET on Child Outcomes

The current study involved time and group as two categorical between-subject independent variables (Group 1 and Group 2), one within-subject independent variable (Time 1 and Time 2) and one continuous dependent variable (PTSD symptoms, resilience, and social support) measured at Time 1 and Time 2. We repeated mixed between-within subjects analysis of variance test for each dependent variable

separately. Initially, we performed statistical analysis by incorporating demographic characteristics as covariates (age, gender, socioeconomic status and parental education). None of the covariates was significantly associated with the outcomes variables, and their inclusion did not change the results. Therefore, we preferred reporting statistical results without considering the effects of covariates. Table 3 summarizes the primary findings related to the interaction effects of the experimental group by time.

PTSD Symptoms

The statistical results of a mixed between-within subjects ANOVA demonstrated a significant group by time (group*time) interaction [$F(1, 73) = 68.99, p < .001$ (partial eta squared = .48, Wilk’s Lambda = .52)] on PTSD scores of the participants. This finding suggests a significant difference in the effectiveness of the intervention between conditions in participants’ scores of PTSD symptoms. Students who received SSET improved over time as the mean PTSD symptom scores for the experimental group reduced. Conversely, students in the control group did not improve as mean scores for PTSD symptoms were the same at baseline and post-intervention (see Table 3). Further, the main effects of time [$F(1, 73) = 66.91, p < .001$ (partial eta squared = .48, Wilk’s Lambda = 1.00)] and group [$F(1, 73) = 46.67, p < .001$ (partial eta squared = .39)] on PTSD symptoms scores were also significant.

Resilience

There was also a significant group by time (group*time) interaction on resilience scores [$F(1, 73) = 60.10, p < .001$ (partial eta squared = .45, Wilk’s Lambda = .55)]. This finding indicates a significant difference in students’ resilience scores over time due to the intervention. Students who received SSET improved over time while the students who did not receive SSET did not improve (see Table 3). Further, the main effects of time [$F(1, 73) = 51.05, p < .001$ (partial

eta squared = .41, Wilk’s Lambda = .59)] and group [$F(1, 73) = 62.98, p < .001$ (partial eta squared = .46)] on resilience scores were also significant.

Social Support

The statistical results also revealed a significant group by time interaction on social support score [$F(1, 73) = 50.74, p < .001$ (partial eta squared = .41, Wilk’s Lambda = .59)]. This finding indicates that the experimental group experienced an increase in perceived social support over time due to the SSET intervention. Specifically, the mean social support scores for students in experimental group increased after receiving the intervention. On the other hand, the social support scores of students in the control group did not change significantly (see Table 3). There was also a significant main effect of time ($F(1, 73) = 44.65, p < .001$ (partial eta squared = .38, Wilk’s Lambda = .62), and group ($F(1, 73) = 6.09, p < .05$ (partial eta squared = .08) on social support.

The patterns were similar for student-reported parental support. There was a significant group by time (group*time) interaction on parental support ($F(1, 73) = 64.42, p < .001$ (partial eta squared = .47, Wilk’s Lambda = .53). This indicated that there was an increase over time in the scores of perceived parental support for the students who received SSET as compared to the students who did not receive SSET. The main effects of time ($F(1, 73) = 61.99, p < .001$ (partial eta squared = .46, Wilk’s Lambda = .54) and group ($F(1, 73) = 15.51, p < .000$, partial eta squared = .18) on parental support were also significant.

Finally, the statistical results of a mixed between-within subjects ANOVA also revealed a significant group by time (group*time) interaction effect on the student-reported teacher support [$F(1, 73) = 27.37, p < .001$ (partial eta squared = .24, Wilk’s Lambda = .73)] and classmate support [$F(1, 73) = 43.81, p < .001$ (partial eta squared = .38, Wilk’s Lambda = .63)]. Again, the pattern in the means showed an increase in perceived support over time for the students

Table 3 Mean differences and mixed between-within subjects of variance (intervention condition by time interactions)

Measures	Baseline		Post-intervention				$F(1, 73)$ p	λ	η_p^2		
	Control group		Experimental group		Control group					Experimental group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				<i>M</i>	<i>SD</i>
PTSD symptoms	52.21	9.01	46.81	12.91	52.35	8.74	32.36	8.83	68.99***	.52	.48
Resilience	71.56	11.87	90.89	16.65	71.56	11.43	102.36	12.13	60.10***	.55	.45
Social support	127.35	15.80	131.84	22.67	126.97	15.67	143.68	20.57	50.74***	.59	.41
Parent support	41.21	6.94	45.13	8.80	41.16	6.96	50.76	7.45	64.42***	.53	.47
Teacher support	44.91	7.38	45.00	9.15	44.86	7.33	47.26	8.25	27.37***	.73	.24
Classmates support	41.21	7.02	41.71	9.18	40.94	6.98	45.65	8.10	43.86***	.63	.38

*** $p < .001$; λ = Wilk’s Lambda; effect size was calculated by using partial eta squared (η_p^2)

who received SSET versus those who did not receive SSET in the experimental group, but not the control group. The main effects of time on teacher support [$F(1, 73) = 26.11, p < .001, \text{partial } \eta^2 = .26, \text{Wilk's } \Lambda = .74$] and classmate support [$F(1, 73) = 37.53, p < .001, \text{partial } \eta^2 = .34, \text{Wilk's } \Lambda = .66$] was also significant. However, the between-group main effects for teacher and classmate support were not significant.

Discussion

The present study was conducted to assess the effectiveness of the Support for Students Exposed to Trauma (SSET) program in reducing PTSD symptoms and building resilience and social support among children in flood-affected rural areas of Pakistan. The intervention, which is designed to be delivered by non-clinically trained personnel, uses standard cognitive-behavioral techniques aimed at increasing children's awareness of their thoughts, feelings, and behaviors after traumatic exposure. The goal is to develop skills to help them cope with trauma symptoms and build resilience. Importantly, the current study represents the first effort of its kind to implement such a program in rural Pakistan. As such, SSET was delivered by a clinically trained interventionist with the support of classroom teachers. This was deemed to be a critical first step in adapting the intervention to the local context and establishing implementation protocols that could lay the foundation for future dissemination of the program. Intervention impacts on children's PTSD symptoms, social support, and resilience were assessed.

Overall, our results confirmed our primary hypothesis that students who received the SSET program would experience significant reductions in PTSD symptoms (in comparison to students who did not receive the intervention). These findings were broadly in keeping with those of Jaycox et al. (2010), who tested SSET within urban middle schools in the US. Even though in the current study SSET was delivered by a clinician, all group sessions were conducted according to the original model. These study's positive results are critical in the much-needed effort to identify interventions that could potentially be deployed in disaster-impacted, low-resourced regions of the world. This current effort was set in schools within rural Pakistan, a region with little to no mental health resources for children. This study lays a foundation for the dissemination of such interventions for delivery by teachers, community workers, and other non-clinical school personnel.

The findings and related study procedures are particularly informative for those who seek to adapt and deploy interventions in different cultural and service contexts than those in which they were originally developed. For the current study, the research team partnered with community

stakeholders in order to identify an intervention that would align with the local service structures and workforce, and adapt it for use locally. The adaption process involved university and community partners. Of note, the team determined that there was little need for adaptation of the content and methods of teaching that content, and focused most heavily on the translation of written materials into Urdu and delivery in the local language. There was also a modification to the typical protocol, which was to have monthly meetings with parents focused on psychoeducation about trauma responses, the skills taught in SSET, and the ways that parents may be able to support their children's skills practice and attendance. This was done because of the strong collectivist cultural context in Pakistan and the cultural expectations around parental involvement. In contrast, in the USA, parental involvement in school-based mental health programs has been routinely cited as a challenge (e.g., Langley et al., 2010; Nadeem, Santiago, Kataoka, Chang, & Stein, 2016). While the relatively minimal adaptation in this study may not be the case for all regions and cultures, the process of intervention adaptation and review used in the current study may be helpful to others seeking to deploy programs in novel contexts.

The study also adds to the literature on the prevalence of PTSD symptoms in children exposed to traumatic events such as a flood. Consistent with the literature on resilience in the face of traumatic events (Neria, Nandi, & Galea, 2008), even though all children the region's schools had exposure to the floods, not all of them exhibited symptoms of post-traumatic stress. However, about 38% of the screening sample did meet the criteria for having significant PTSD symptoms. This rate is similar to those found in other studies using the CRIES-13 with samples considered at-risk for post-traumatic stress, but higher than those found in general community samples (e.g., Deeba et al., 2014; Perrin et al., 2005).

The current study also explores two unique outcomes that are often not examined in studies of mental health intervention: resilience and social support. Specifically, our results indicated that there were significant differences in resilience as well as in support children perceived from parent, teacher, and classmate between experimental and control groups after receiving the SSET intervention. These findings are intriguing given the recent emphases in the field not only on ameliorating symptoms but also in taking strength-based approaches that recognize and support resiliency (Chmitorz et al., 2018). From a primary prevention standpoint, this is also an important finding. Generally, SSET is viewed as an early intervention program for students who may or may not have a formal diagnosis of PTSD but who have significant symptoms. If resiliency skills persist over time, as students face additional natural disasters and associated traumatic

events or even non-disaster-related adversity, they may be better equipped to cope. Prevention-focused research could explore the utility of SSET in this context.

Social support is an important indicator of all mental health outcomes (Harandi, Taghinasab, & Nayeri, 2017), and social support and cognitive appraisals of this support are strong predictors of children's post-traumatic adjustment (Hitchcock, Ellis, Williamson & Nixon, 2015). In the current study, students who received SSET increased in perceived teacher support, parent support and classmates support in children of flood-affected schools in the experimental group in comparison to the control group. While these are self-reported outcomes, it is interesting that children perceived that they had more support after taking part in a trauma intervention than they did before. It could be that being part of the group conducted at school (co-facilitated by a teacher) makes them feel more connected to peers and adults in their schools, and it could be that the group encourages students to access their existing supports. However, it is important to note that such effects may not be specific to SSET and might have been similarly achieved in other sorts of supportive meetings between students and teachers. The ongoing involvement of parents in SSET could also be further explored. This perceived support may serve as a protective factor in the development of PTSD and other mental health issues and is consistent with findings that support from peers and the presence of close friends is a protective factor in the development of mental health issues (Lagana, 2004). School connectedness is also a protective variable for children (Panter-Brick, Goodman, Tol, & Eggerman, 2011), and it might be enhanced through this work.

There are limitations to the study that are important to take into account in interpreting the results. First, while it is a major strength that the study was designed as a randomized control trial conducted at real-world sites, the study lacked an active comparison group. This would have provided helpful information about the intervention effects compared to alternative approaches. Second, while the effects were detected, the limited sample size suggests the need for replication using a larger sample size in different contexts within Pakistan and in other disaster-prone, low-resource contexts in order to ensure generalizability. Because this is a burgeoning area of research, studies with larger samples will also allow examination of potential intervention moderators such as participant age, gender, socioeconomic status, and symptom severity. Third, the study had an immediate post-test, but no longer-term follow up. Fourth, the study was limited to self-report measures. Future research should include teacher and parent assessment of symptoms and functioning. Furthermore, the present study did not utilize a formal measure of fidelity to the SSET model. Rather, fidelity was supported via supervision and limited live observation. Live observation may be a promising option when

recordings are not feasible, however, the study remains limited by the lack of an objective fidelity tool. Finally, the study was not conducted using local non-clinical providers and instead used university-based researcher-clinicians in order to build evidence for its local application. We do feel that given the uncharted nature of the application of the intervention in rural Pakistan, this initial implementation was an important first step. However, this work needs to be replicated with non-clinicians. The inclusion of a teacher as a co-facilitator is a step in establishing local readiness to move in that direction.

Implications

Despite these limitations, the study is important in several ways. It is clear that there is a tremendous need for intervention programs focused on traumatic stress due to high rates of trauma exposure among students in flood-impacted regions of rural Pakistan. As CBITS (the invention upon which SSET is based) has been disseminated more widely, studies have pointed to the importance of setting up supportive implementation structures and sustainment-enhancing strategies (Langley et al., 2010; Nadeem & Ringle, 2016). With respect to disaster contexts, Henderson and Elsass (2015), have argued that long-term interventions for post-disaster distress should consider not only the past traumatic exposure but also how some of the sequelae of being impacted by such traumatic effects can interact with and contribute to chronic stressors. Socio-contextual variables such as income, education and social support should be also considered in planning and implementing interventions.

The findings of the present study have important implications in furthering both the application and evidence-base for CBT-based mental health services provided in rural areas across Pakistan and perhaps in other regions of the world. Pakistan is facing challenges related to terrorism, natural disasters, as well as other traumatic events that are commonly experienced among children and adolescents. The results of the current study provide support for one promising strategy for maintaining mental health and well-being of children that could be implemented in theory by non-clinicians. Within Pakistan, SSET may also be useful for children impacted by domestic terrorism, children in earthquake areas, and children exposed to abuse, community violence, and domestic violence. In fact, researchers and practitioners working in a post-Katrina context in the gulf region noted that while initial efforts were focused on the hurricane itself, many students that were served reported multiple and varied trauma experiences (Jaycox et al., 2010). Now that a foundation has been laid, future efforts may expand the reach for trauma-focused interventions to include direct assessment of other types of trauma and the psychological responses to this exposure.

Similarly, the intervention may be trialed in other regions and countries facing similar issues. Another implication of the study is that the cognitive-behavioral intervention approach appears to have been a good fit for the students in the schools in rural Pakistan, and this kind of approach could potentially be well-received in other regions of South Asian. SSET also appeared to help build resilience among youth and helped students to access their social supports. This suggests that there may be some value in providing training around trauma awareness, resilience, and social support to the larger school community, highlighting some of the additional benefits of such interventions beyond symptom reduction.

A critical next step in this line of research and practice will be to train non-clinical providers to deliver the intervention. Although the lead clinician in the study was able to translate the materials to Urdu, Punjabi and Siraiki, this task would likely have been more challenging for personnel not already familiar with the clinical terminology and concepts used in the intervention. There are also some potential workforce challenges as the schools in the region have limited teachers with limited time to provide additional intervention, and there is often no additional student support staff in all schools. The use of out of class time may be one solution. Despite the overarching issues related to staffing and accessibility, SSET still shows promise as a school-based intervention in an under-resourced community. As services such as SSET are further expanded, it will be important to establish sustained capacity to implement by local, indigenous school personnel.

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