Journal of Family Strengths

Volume 19
Issue 1 *The Impact of Hurricanes on Children and Families and Interconnected Systems*

Article 7

8-2019

Implementation of a Multi-Phase, Trauma-Focused Intervention Model Post-Hurricane Maria in Puerto Rico: Lessons Learned from the Field Using a Community Based Participatory Approach

Rosaura Orengo-Aguayo
Medical University of South Carolina, Department of Psychiatry and Behavioral Sciences,
orengoaa@musc.edu

Regan W. Stewart
Medical University of South Carolina,Department of Psychiatry and Behavioral Sciences,
stewartr@musc.edu

Michael A. de Arellano
Medical University of South Carolina, Department of Psychiatry and Behavioral Sciences,
dearelma@musc.edu

Freddie A. Pastrana
Medical University of South Carolina, Department of Psychiatry and Behavioral Sciences,
pastrana@musc.edu

Bianca T. Villalobos
Medical University of South Carolina, Department of Psychiatry and Behavioral Sciences,
villalbi@musc.edu

Follow this and additional works at: https://digitalcommons.library.tmc.edu/jfs

Recommended Citation
Orengo-Aguayo, Rosaura; Stewart, Regan W.; de Arellano, Michael A.; Pastrana, Freddie A.; Villalobos, Bianca T.; Martínez-González, Karen G.; Suárez-Kindy, Joy Lynn; and Brymer, Melissa (2019) "Implementation of a Multi-Phase, Trauma-Focused Intervention Model Post-Hurricane Maria in Puerto Rico: Lessons Learned from the Field Using a Community Based Participatory Approach," *Journal of Family Strengths*: Vol. 19: Iss. 1, Article 7.
DOI: https://doi.org/10.58464/2168-670X.1399
Available at: https://digitalcommons.library.tmc.edu/jfs/vol19/iss1/7

See next page for additional authors

The Journal of Family Strengths is brought to you for free and open access by CHILDREN AT RISK at DigitalCommons@The Texas Medical Center. It has a "cc by-nc-nd" Creative Commons license" (Attribution Non-Commercial No Derivatives) For more information, please contact digitalcommons@exch.library.tmc.edu

The TMC LIBRARY Health Sciences Resource Center

Implementation of a Multi-Phase, Trauma-Focused Intervention Model Post-Hurricane Maria in Puerto Rico: Lessons Learned from the Field Using a Community Based Participatory Approach

Acknowledgements

We are profoundly grateful to all of the Puerto Rico Department of Education leadership and staff who so generously shared their experiences, needs, and hopes for the children of Puerto Rico with us. We also thank Annette La Greca, PhD, Scott Sevin, and Alan Steinberg, PhD for their helpful post-disaster screening and intervention consultation and to the National Center for Child Traumatic Stress and its National Child Traumatic Stress Network partners for their generous consultation and support. Finally, we thank Edmarie Guzmán-Velez, PhD and Héctor De Jesús-Cortés, PhD for connecting us to the PR-DE and paving the way for this work.

Authors

Rosaura Orengo-Aguayo, Regan W. Stewart, Michael A. de Arellano, Freddie A. Pastrana, Bianca T. Villalobos, Karen G. Martínez-González, Joy Lynn Suárez-Kindy, and Melissa Brymer

This article is available in Journal of Family Strengths: https://digitalcommons.library.tmc.edu/jfs/vol19/iss1/7

Implementation of a multi-phase, trauma-focused intervention model post-Hurricane Maria in Puerto Rico: Lessons learned from the field using a community based participatory approach

Introduction

Hurricane Maria struck Puerto Rico (PR) on September 20, 2017 as a powerful Category 4 storm with sustained winds of more than 155 mph, becoming the most powerful and costliest hurricane (estimated $90 billion in damages) to impact PR in almost a century. Maria destroyed the island's entire power and communications systems, leaving 100% of Puerto Ricans without access to electricity, water, or the ability to communicate with loved ones for months. On average, Puerto Ricans spent 84 days without electricity, and it took 13 months for electricity to be fully restored across the entire island, becoming the longest power outage in modern U.S. history (Kishore et al., 2018). Over 20 inches of rain fell over the course of 24 hours resulting in catastrophic flash flooding, and more than a half million homes and buildings were destroyed (Pasch, Penny, & Berg, 2018). Food and water distribution by the Federal Emergency Management Agency (FEMA) were significantly delayed, compared to response times to contemporary disasters (e.g., Hurricane Harvey in Houston, Texas) with the agency reporting that it was ill-prepared to handle a disaster of that magnitude outside of the mainland US (FEMA, 2018). Mortality rates rose by 62%, compared with the previous year, with an estimated 4,645 hurricane-related deaths (Kishore et al., 2018). Over 200,000 Puerto Ricans migrated to the mainland US because of the hurricane, with estimates suggesting this number will continue to rise (Hinojosa & Melendez, 2018), resulting in unprecedented ruptures of support networks. As such, Hurricane Maria resulted in a public health crisis that has defined a generation of Puerto Ricans, with many describing their lives as "before Maria" and "after Maria."

The current paper describes the process by which our team established a partnership with the Puerto Rico Department of Education (PR-DE) to implement a three-phase, trauma-focused intervention model, informed by best practice post-disaster guidelines (IOM, 2015), beginning immediately after Hurricane Maria impacted Puerto Rico and continuing over the course of one year. We first present a review of the extant literature on the impact of natural disasters on children and adolescents, predictors of post-disaster recovery, stages of the post-disaster psychological recovery process as well as evidence-based interventions and describe the important role that schools can play in the delivery of these interventions. We then describe the implementation of the *Puerto*

Rico Outreach Model in Schools-Esperanza (PROMISE), an evidence-informed model based on these post-disaster guidelines and informed by a Community-Based Participatory Approach (CBPA), in which the needs and goals of our main collaborators (PR-DE) were crucial in helping shape and tailor all phases of the implementation process. We provide 23 lessons learned from the field, woven throughout our description of the implementation of PROMISE, and conclude with implications for practice, training, policy, and future research.

Impact of Natural Disasters on Children

Natural disasters include all types of severe weather events (e.g., hurricanes, tsunamis, earthquakes, tornadoes, wildfires, and floods), which can pose a significant threat to human safety, security, health, and infrastructure (Fischer, 2003). Other consequences include disruptions in social support networks as a result of displacement; forced migration; and school, job, and community closures (Fisher & de Mello, 2011). In the US, approximately 14% of children and adolescents report having experienced a disaster (man-made or natural) in their lifetime (Becker-Blease, Turner, & Finkelhor, 2010; McLaughlin et al., 2013), while globally an estimated 175 million children will be affected every year by natural disasters because of climate change (Seballos, Tanner, Tarazona, & Gallegos, 2011). Natural disasters are thus a significant public health concern, and children are disproportionately impacted and uniquely vulnerable to their effects (World Disasters Report, 2018).

In the immediate aftermath of a disaster, access to basic needs can be severely compromised (e.g., shelter, healthcare, food, clean drinking water, and proper sanitation; Seballos et al., 2011). Long-term impact of disasters can result in disruptions in families, neighborhoods, schools, and broader communities (Bonanno, Brewin, Kaniasty, & La Greca, 2010). Disruptions in social support networks due to family separation, changes in schools, displacement, and/or death of a loved one uniquely impact children given their dependence on adult caregivers for safety, security, and access to basic needs (Bonnano et al., 2010). The cumulative effects of these stressors and the fact that adults in their lives are also coping with the aftermath of a disaster, leave many children at a disadvantage when it comes to help-seeking and access to services (Silverman & La Greca, 2002).

Children exposed to natural disasters are at increased risk for developing a host of mental health and health problems including posttraumatic stress disorder (PTSD), depression, grief/traumatic grief, anxiety disorders, externalizing problems, developmental disruptions (e.g.,

regressions), social withdrawal, physical complaints, increased risk for acute illnesses, and substance use disorders (Bonanno et al., 2010; Brymer, Reyes, & Steinberg, 2012). These reactions may manifest in a host of ways, including development of specific fears, separation anxiety, sleep problems, somatic complaints, irritability, aggression, isolation, bullying, suicidal ideation, and decline in academic performance, all of which vary by developmental stage (Bonnano et al., 2010; Kronenberg et al., 2010).

Although posttraumatic stress reactions are common following natural disasters, research suggests that racial and ethnic minorities are more likely to develop PTSD. For example, Perilla and colleagues (2002) found that following Hurricane Andrew in southern Florida, Spanish-speaking Hispanic adults experienced a significantly higher rate of PTSD as compared to non-Hispanic Caucasian disaster survivors (38% and 15% respectively). A study by La Greca and colleagues (1996) also found that Hispanic and African American children were more likely than Caucasian children to report higher levels of PTSD symptoms following Hurricane Andrew, possibly due to pre-existing economic disparities that may result in greater exposure and less access to resources during the recovery process (Norris, Friedman, Watson, & Byrne, 2002). In terms of unique expressions of traumatic stress in Latino youth, Felix and colleagues (2011) found that the level of disaster exposure following Hurricane Georges in Puerto Rico (1998) predicted the development of internalizing symptoms such as major depression, social phobia, and separation anxiety, rather than PTSD symptoms, in a sample of Puerto Rican children. The studies that have examined academic achievement among disaster-exposed children have found that trauma exposure and traumatic stress are indirectly linked to lower academic achievement through PTSD symptoms, test anxiety, and aggressive behavior (Scott, Lapré, Marsee, & Weems, 2014; Weems et al., 2013).

Taken together, a disaster public health approach to examining the impact on children and adolescents include the following factors: (a) aspects of the disaster experience (e.g., life treat, loss, and disruption); (b) preexisting child characteristics (e.g., age, gender, socioeconomic status, prior trauma history, and prior mental health history), (c) post-disaster recovery environment (e.g., access to basic needs and interventions, social support, and functioning of caregivers); (d) coping skills (e.g., helpful emotional regulation strategies); and (e) intervening stressful life events (e.g., death of a family member, divorce, or displacement) (La Greca et al., 1996; Pynoos, Goenjian, & Steinberg, 1998). Children who perceive their life or the lives of their loved ones to be at risk, who are in

closer proximity to the disaster, have experienced greater loss, are female, are younger, have pre-existing trauma and/or mental health concerns, have experienced significant stressors post-disaster, and have poor social support or coping skills are at greatest risk of developing posttraumatic stress symptoms and non-remitting chronic stress (Bonnano et al., 2010; Furr et al., 2010).

Prospective studies generally report a decline in traumatic stress symptoms among youth within the first 10 months to a year post-disaster (Kronenberg et al., 2010); however, in one diverse sample, 70% of children continued to show stable or higher elevations of PTSD symptoms 2.5 years after Hurricane Katrina, likely due to long-lasting disruptions in social and community networks (Weems et al., 2010). In terms of typical responses, three major trajectories have been found for youth after experiencing hurricanes: 1) those who demonstrate *resiliency* with stable healthy functioning (37–45%); 2) those who demonstrate *recovery* with a decline in symptoms over time (27–43%); and 3) those who demonstrate *chronic distress* with posttraumatic stress symptoms that remained near or above the clinical range 10 months post disaster (20-23%; Kronenberg et al., 2010; La Greca et al., 2013). These trajectories are consistent with those found in the adult literature on traumatic responses across different types of traumas, including natural disasters (Bonanno et al., 2010). Children still reporting clinically elevated posttraumatic stress symptoms at one year following the event, along with children reporting comorbid symptom elevations (e.g., anxiety and depression) are at significantly higher risk of non-remittance of symptoms 1.5–2 years post-disaster, making them important targets for intervention (La Greca et al., 2010; Lai et al., 2013).

Predictors of Post-disaster Recovery

Social support, both received and perceived, has been one of the most frequently cited predictors of post-disaster adjustment (Bonanno et al., 2010; Hobfoll et al., 2007). More social support after a disaster was found to be related to a lower risk of depression for children in a meta-analysis examining risk factors (Tang, Liu, Liu, Xue, & Zhang, 2014). La Greca and colleagues (2013) found that those who received more social support had greater odds of recovery from posttraumatic stress symptoms, while children with lower levels of reported social support were more likely to experience chronic distress. Perceived helpfulness of support from sources other than family members (e.g., teachers, school staff, friends, and church members) have also been shown to result in decreased

posttraumatic stress, anxiety, and depressive symptoms in youth (Pina et al., 2008).

Type of coping strategies used by children also appears to predict post-disaster recovery. Children who use positive coping strategies (e.g., active problem-solving, cognitive restructuring, and seeking information from trusted sources) report lower posttraumatic stress and anxiety symptoms (Pina et al., 2008). On the other hand, use of avoidant coping strategies (e.g., blaming, yelling, repression, and isolation) predict greater self-reported PTSD, anxiety and depressive symptoms post-disaster (La Greca et al., 2013; Russoniello et al., 2002). Additionally, factors related to the post-disaster recovery process can impact recovery in children. For instance, children who in the aftermath of a disaster have access to basic needs, whose communities receive immediate and ongoing assistance, whose community and school routines are reestablished, and whose caregivers are able to reinitiate in their jobs and maintain a sense of family stability are less likely to develop long lasting mental health concerns (Bonnano et al., 2010). As such, post-disaster intervention guidelines for children and adolescents recommend a focus on: (a) increasing access to basic needs (e.g., clean water, food, clothing, shelter, and medical care); (b) promoting safety and security within communities and families; (c) bolstering social support networks; and (d) teaching positive coping skills (Bonnano et al., 2010; La Greca & Silverman, 2009).

Stages of Post-Disaster Recovery and Psychological Interventions

Post-disaster intervention efforts have been grouped into three phases: (a) *immediate* aftermath of the event (day of the event to a few weeks); (b) *short-term* recovery and rebuilding phase (one month up to a year); and (c) *long-term* recovery phase (one year up to a few years). The goals of the psychological interventions depend on the timeframe (immediate vs. recovery phases) and context in which they are delivered, as this will determine the most pressing needs of the affected population which will naturally evolve over time (La Greca & Silverman, 2009). Please see Table 1 for a summary of the interventions by phases of recovery.

Phase 1: Immediate Aftermath of a Disaster (Day of event up to a few weeks post-disaster)

In the immediate aftermath of a disaster, restoring access to basic needs (e.g., food, water, clothing, medical attention, shelter), promoting a sense of safety and security, and reconnecting loved ones should be the number one priority of any intervention. Interventions should be brief and present-focused with the goal of reducing or preventing long-term distress and

dysfunction (La Greca & Silverman, 2009). *Psychological First Aid* (PFA) is an evidence-informed, culturally and developmentally sensitive intervention developed by disaster mental health experts aimed at providing practical assistance and promoting a sense of safety, security, calm, connectedness, hope, and self and community efficacy to survivors after a disaster (Brymer et al., 2006; Hobfoll et al., 2007). PFA is designed to reduce the initial distress caused by a disaster and to foster adaptive functioning and coping strategies both in the short and long-term among adults and children. PFA is a modular approach so you can best meet the needs of those you are serving.

The National Child Traumatic Stress Network (NCTSN)/National Center for PTSD (NCPTSD) PFA model (Brymer et al., 2006) is comprised of eight core actions: (a) Contact and Engagement, (b) Safety and Comfort, (c) Stabilization, (d) Information Gathering, (e) Practical Assistance, (f) Connection with Social Supports, (g) Information on Coping, and (h) Linkage with Collaborative Services. Each core action is selected and delivered based on the unique needs the survivors identify during the initial contact. It is flexible in that it can be delivered in just one meeting (ranging anywhere from a few minutes to a couple of hours) or over multiple contacts, individually or as a group, in a wide range of settings (e.g., shelters, schools, and hospitals), via lay providers (e.g., first responders) or by mental health professionals as part of a coordinated disaster effort response (Brymer et al., 2006). PFA does not assume that all survivors will go on to develop chronic distress or mental health problems. Rather, it assumes that all survivors will experience a myriad of reactions after the event, all of which are expected and common in the short term. The goal is to offer practical assistance and basic coping skills early on in the immediate aftermath of a disaster to help to bolster resiliency and help mitigate potential long-term stress reactions that can later interfere with adaptive functioning and natural recovery. Furthermore, it serves early on to identify survivors with severe distress who may benefit from additional services (Brymer et al., 2006; Vernberg et al., 2008).

Controlled research evaluations of PFA have not been conducted, in great part due to the complexities of conducting this type of research (e.g., ethics of random assignment to treatment versus no treatment, the flexibility of delivering the intervention, and obtaining funding and institutional review board approval prior to a disaster) (Dieltjens et al., 2014; Forbes et al., 2011, Steinberg et al., 2006). Existing studies have focused primarily on examining providers' views of increased knowledge and satisfaction with PFA training and perceived helpfulness and

appropriateness of PFA for survivors (e.g., Akoury-Dirani et al., 2015; Allen et al., 2010). Significantly more research is needed to examine the feasibly, acceptability, and effectiveness of PFA in bolstering resiliency and psychological recovery after a disaster with different populations groups and contexts. Until more research studies are conducted, best practice guidelines recommend that psychological interventions provided in the aftermath of a disaster be based on evidence-informed psychoeducational materials and Cognitive Behavioral Therapy (CBT) procedures, such as the components offered in PFA, to help children better cope with post-disaster stressors.

Phase 2: Short-term Recovery and Rebuilding (A few months up to one-year post-disaster)

Although the timing, setting, and service providers for the immediate response, intermediate recovery, and longer-term recovery will vary by type of disaster and post-disaster ecology, it is generally accepted that different levels or tiers of intervention are needed for each of these stages. Tier I interventions provide outreach, public health information, basic needs, and PFA to the general population. Subsequent adversities are quite common after large-scale disasters, therefore continuing PFA interventions for the affected communities is essential. Tier II interventions provide more specialized child and adolescent trauma and grief interventions for those with moderate-to-severe persisting distress. These interventions can often be provided by paraprofessionals or community providers. Tier III interventions are trauma and grief treatments for children and adolescents who require formal mental health treatment (Brymer et al., 2012; Pynoos et al., 1998). By targeting children with the most appropriate tiers of intervention based on current symptomatology, the often-limited mental health specialists will be available to treat the most severely impacted youth.

Skills for Psychological Recovery (SPR; Berkowitz et al., 2010) is a Tier II intervention that is an evidence-informed, skills-training community-based intervention designed to bolster resiliency and increase self-efficacy in the recovery phase (after the initial crisis has subsided) and once survivors have access to safety, security, and other basic needs. The goal of SPR is to teach survivors evidence-based coping skills (based on CBT principles) that have been shown to be effective at reducing ongoing distress following a disaster. SPR is a secondary prevention intervention model in that it provides a level of care that is more intensive than PFA but is not designed to address severe psychopathology. SPR is a brief, skills-based intervention, that can be delivered in one to five sessions,

depending on the survivors needs. It is designed to be delivered by mental health, other health workers (e.g., social workers, counselors, victim advocates), or paraprofessionals (e.g., disaster crisis counselors) who provide ongoing assistance and support to affected children and adults, within a variety of settings, including schools, primary care clinics, faith-based organizations, homes, among others. Similar to PFA, SPR uses a modular approach so that providers can tailor the skills taught to the unique needs of the child, adolescent, adult, family, or group that they are working with.

SPR is comprised of six core skills: (a) information gathering, (b) building problem-solving skills, (c) promoting positive activities, (d) managing reactions, (e) promoting helpful thinking, and (f) rebuilding health social connections. For many survivors, this Tier II intervention will be all they need to psychologically recover after a disaster. However, in cases in which more intensive mental health treatment is required, providers can identify this need and refer to specialized psychotherapy services (Berkowitz et al., 2010). Although the coping skills taught in SPR have been shown to be effective at addressing a host of mental health concerns (e.g., anxiety, depression, trauma-related stress), controlled research studies examining the effectiveness of SPR post-disaster have not been conducted. One study conducted by Forbes and colleagues (2010) found that health providers rated the modules as useful for survivors of disasters, reported confidence in delivering the intervention, and found the intervention acceptable and useful for disaster survivors with moderate-level symptoms. Clearly, research examining the effectiveness of these components on behavior and symptom change, as well as feasibility and acceptability studies within different post-disaster contexts is needed.

Phase 3: Long-term Recovery (1 year up to several years post-disaster)

A significant minority of children (approximately 20%) will experience moderate-to-severe chronic stress reactions (e.g., PTSD, depression, anxiety, complicated bereavement, and externalizing behaviors) and need a Tier III intervention. Best practice guidelines recommend that children scoring in moderate-to-severe levels of mental health symptoms receive evidence-based cognitive behavioral trauma/grief interventions that have been shown to effectively treat these trauma-related problems in children and adolescents (La Greca & Silverman, 2009). The two interventions with the most empirical support are *Cognitive Behavioral Intervention for Trauma in Schools* (CBITS; Jaycox, Langley & Hoover, 2018), which is appropriate for addressing *moderate* trauma-related symptoms in a group-

based format and *Trauma-Focused Cognitive Behavioral Therapy* (TF-CBT; Cohen, Mannarino, & Deblinger, 2017), which is most appropriate for addressing *moderate-to-high* trauma-related symptoms in an individual format. Triage to one or the other would depend on the severity of symptoms and whether group-based treatment or individual treatment is most appropriate (see descriptions below).

Cognitive Behavioral Intervention for Trauma in Schools (CBITS; Jaycox, Langley & Hoover, 2018), is a school-based, group intervention aimed at relieving *moderate* symptoms of PTSD, depression, and general anxiety among children exposed to trauma. Children are provided with normalizing education about common reactions to stress and trauma and learn skills such as relaxation, how to challenge and replace upsetting thoughts, and problem-solving. Children also work on processing traumatic memories and grief in both individual and group settings. The program consists of 10 group sessions (6–8 children per group), 1–3 individual student sessions, two caregiver meetings, and an optional school staff information session. All sessions are conducted within schools and designed to be delivered within a class period. CBITS is for students grades 5th and older. There is a K–5th grade developmentally adapted version of this protocol called *Bounce Back* which targets the same components as CBITS but is developmentally appropriate for younger children. CBITS has been shown to decrease self-reported PTSD and depressive symptoms among Spanish-speaking immigrant students (Kataoka et al., 2003) and children who experienced Hurricane Katrina in New Orleans (Jaycox et al., 2010), as well as demonstrated reductions in caregiver-reported behavioral and emotional problems in their children (Stein et al., 2003). Bounce Back, has been shown to decrease PTSD and anxiety symptoms in a randomized controlled trial compared to wait-list group (Langley et al., 2015).

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2017) is an empirically validated, multi-component psychotherapy model that addresses *moderate-to-high* trauma-related symptoms, including PTSD, depression, and moderate behavioral problems. TF-CBT is designed for children and adolescents ages 3–18 and can be delivered within schools, clinics, or in the community (de Arellano et al., 2005). The typical course of treatment is 12–16 sessions, with a longer duration (up to 25 sessions) for complex trauma. TF-CBT uses individual parallel sessions with the child and supportive caregiver, as well as conjoint parent-child sessions. The intervention includes eight treatment components that comprise the acronym “PRACTICE”: (a) Psychoeducation and parenting skills, (b)

Relaxation, (c) Affective expression and modulation, (d) Cognitive coping; (e) Trauma Narrative (TN) development and processing, (f) In vivo mastery of trauma reminders, (g) Conjoint sharing of the TN, and (h) Enhancing future safety and development. TF-CBT has undergone extensive empirical investigation and efficacy has been established through numerous randomized controlled trials, across a wide-range of populations (Cary & McMillen, 2012; de Arellano et al., 2014) and delivery modalities (Stewart, Orengo-Aguayo, Cohen, Mannarino, & de Arellano, 2017) in treating PTSD, depression and behavioral difficulties among trauma-exposed youth.

Best practices for disaster behavioral health interventions in the long-term recovery phase suggest that children and adolescents with moderate-to-severe trauma-related symptoms be assessed and referred to the most appropriate evidence-based, cognitive behavioral intervention (La Greca & Silverman, 2009). The available empirical evidence points to *CBITS/Bounce Back* for moderate trauma-related symptoms in which a group-based format in a school setting would be appropriate and *TF-CBT* for moderate-to-high trauma-related symptoms in which individual sessions would be most appropriate.

School-Based Delivery of Post Disaster Interventions

Schools provide an ideal setting in which to implement a multi-tiered, trauma-focused intervention model after a natural disaster (Brown et al., 2017; Jaycox et al., 2007). For instance, schools can help restore a sense of routine and normalcy in children, provide a safe and secure space with access to meals and shelter, and serve as a hub for distribution of resources and information to families and community members after a natural disaster. Schools are usually the first place where children's behavioral health needs are identified and treated. For example, teachers can be attentive to changes in behaviors and functioning in students that are a marked change from before the natural disaster. Furthermore, schools have a built-in workforce (e.g., teachers, social workers, psychologists, nurses, and counselors) that can be trained to lead socio-emotional activities with students and parents aimed at teaching positive coping skills and building stronger social support networks between classmates, parents, and school staff, all of which are predictive of positive post-disaster recovery outcomes (Felix, You & Canino, 2013; Jaycox et al., 2007). Finally, schools are accessible to students, forgoing the most common logistical barriers to accessing office-based psychological services (e.g., lack of transportation, caregiver work schedules; Evans & Weist, 2004; Jaycox, et al., 2010).

However, any school-based intervention implemented after a disaster should take into account that educators themselves have also undergone disaster-related stressors and losses. As such, interventions should focus on attending to educators' own socio-emotional needs, with a special emphasis on self-care (Jaycox et al., 2007; Kilmer, Gil-Rivas, & McDonald, 2010). Furthermore, when schools are severely damaged or destroyed, additional adversities occur (e.g., relocation of school community, potential overcrowding in recipient schools, and frequent mobility of students). Post-disaster school-based interventions should therefore also address these additional stressors and their impact on children and staffs' sense of safety and belonging. School-based interventions should also be sensitive to the already existing academic-related expectations for staff and be careful not to overburden or interfere with these important academic objectives which are also disrupted after a natural disaster (Dean et al., 2008; Jaycox et al., 2007).

Implementation of Post-Disaster Psychological Interventions using a Community Based Participatory Approach

Given the unique nuances of implementing post-disaster interventions within an educational system island-wide, a Community-Based Participatory Approach (CBPA), grounded on dissemination and implementation science, was viewed as a promising way to engage community partners in implementing a post-disaster behavioral health response (Brown Curran, Palinkas, Aarons, et al., 2017; Lurie, Manolio, Patterson, Collins, & Frieden, 2013). Dissemination and implementation (DI) science aims "to improve the adoption, appropriate adaptation, delivery, and sustainment of effective interventions by providers, clinics, organizations, communities, and systems of care." (Brown et al., 2017, pg. 3). The National Institutes of Health (NIH) recognize the importance of active collaboration between community partners and researchers when conducting DI projects and encourages the use of Community Based Participatory Research approaches (Blachman-Demner, Wiley, & Chambers, 2017). A Community-Based Participatory Approach (CBPA; also referred to as "Community-Partnership Research"; Becker, Stice, Shaw, & Woda, 2009 and "Community Engaged Research"; Blachman-Demner, et al., 2017) recognizes the value of community partners and stakeholders' opinions, expertise, and needs and invites open collaboration, active problem-solving, and sharing in the decision-making process of the design of a project with the ultimate goal of collectively addressing complicated, real-world problems (Israel, Eng, Shulz, & Parker, 2005).

A CBPA is based on the following principles (Israel et al., 2003; 2005): (a) building on community strengths and resources; (b) fostering collaborative, truly equitable partnerships between researchers and community members; (c) bi-directional learning between academic and community partners; (d) balancing the acquisition of knowledge with the provision of useful interventions that can benefit the community; (e) focusing on the immediate relevance of mental, social, and physical health problems to communities; (f) using a collaborative and iterative process to review the project's progress and adjust accordingly; (g) sharing results with partners in a way that is clear, useful, and respectful; and (h) making a long-term commitment to the community with a focus on sustainability.

A CBPA invites the implementer of these post-disaster trainings and interventions to adopt a humble and respective stance and to consult first with the community partners (e.g., school staff, administrators) on their unique needs, barriers, facilitators, and goals for a post-disaster response both short and long term, and to use this information to tailor the implementation process in an iterative manner. The implementation design should include four phases: (a) Exploration: examining whether a service delivery system or community organization would find a particular intervention useful, given its unique context, and is interested in adopting it; (b) Preparation: establishing collaborations, supports, funding, and adapting procedures to implement the intervention in the given context; (c) Implementation: enact processes, refine and adapt iteratively with input from all partners, monitor impact, and track progress; and (d) Sustainment: maintain the intervention and products long term, even after funding or project timelines expire (Aarons, Hurlburt, & Horwitz, 2011). Key factors in the success of such an implementation plan grounded in a CBPA include: (a) a grass roots initiative from community partners willing to champion the project; (b) a project or study that is co-designed by the researcher and partners; (c) ongoing building of trust demonstrated by the researcher through consistency, collaboration, and respect; (d) and the researchers willingness to negotiate study design, logistics, or implementation procedures based on the community partners' input over time (Becker et al., 2009).

Puerto Rico Outreach Model in Schools-Esperanza (PROMISE)

The current paper describes the process by which our team established a partnership with the Puerto Rico Department of Education (PR-DE) to implement a three-phase, trauma-focused disaster behavioral health model, informed by best practice post-disaster and implementation science guidelines, beginning immediately after Hurricane Maria impacted

PR. We aim to describe the step-by-step implementation of this evidence-informed *PROMISE* model which was guided by a CBPA in which the needs and goals of our main collaborators (PR-DE) were crucial in shaping and tailoring all phases of the implementation process.

PROMISE included 3 phases: Phase 1 (three weeks post-hurricane): Providing *Psychological First Aid (PFA)* training for school teachers and staff to meet the needs of all students affected by the hurricane through classroom-based intervention; Phase 2 (six months post-hurricane): Providing *Skills for Psychological Recovery (SPR)* training for school social workers and psychologists to meet the needs of students with sub-clinical post-hurricane-related concerns and; Phase 3 (one year post-hurricane): Providing *Trauma-Focused Cognitive Behavioral Therapy* (TF-CBT) training for school psychologists to address higher-level and unremitting trauma-related symptoms in students.

The remainder of this paper focuses on: (a) describing these three phases using a step-by-step, descriptive approach; and (b) highlighting important lessons learned, implications for practice, training, policy, and future research. Information is presented in a chronological, narrative format intended to serve as a "road map" that future teams interested in post-disaster work can use to learn from our experiences, avoid encountered pitfalls, and refine the processes described collaboratively with their community partners using a CBPA. Twenty-three lessons learned are included throughout the description of each phase, and Table 2 provides a summary of these lessons, grouped by post-disaster phase. A total of 11 lessons learned were related to the importance of using a CBPA to guide our implementation plan throughout each post-disaster phase. Six lessons centered around the importance of using post-disaster guidelines to guide our implementation plan. Four lessons focused on the importance of being flexible, creative, and adapting to the local context. One lesson focused on the importance of self-care when conducting post-disaster work. Finally, one lesson centered on the importance of being courageous and pursuing this line of work despite the challenges.

Phase 1: Immediate Aftermath of Disaster (First three weeks post-disaster)

Day of Disaster: On September 20, 2017, at approximately 6:15 am local time, Hurricane Maria made landfall in the southeastern town of Yabucoa, PR, and slowly made its way across the entire island as a category 4 hurricane over the next 20–24 hours. At 9:00 am Eastern time, as the hurricane was making its way through the island, our team met to provide each other with support amidst the anxiety of losing contact with our loved

ones (first author and fourth author are native Puerto Ricans with family living on the island). The media footage of the hurricane ravaging the island, the reports of massive destruction and flooding, along with the last social media posts of friends and families ("this is the scariest moment of my life," "the sound is unbearable," and "if you read this, please send help") left a feeling of despair along with a profound desire to help.

As academics, mental health providers, and trauma researchers, we brainstormed how to put our skillset, resources, and networks to best use to make an immediate and long-term impact in PR. One of our team's core values is humility. We quickly recognized our limited understanding of post-disaster response and therein lies *Lesson #1*—partner with experts who can provide guidance and read anything you can on the subject. We contacted Dr. Melissa Brymer, Director of Terrorism and Disaster Programs at the UCLA-Duke National Center for Child Traumatic Stress, national leading expert in post-disaster and terrorism response, and co-creator of *PFA* and *SPR*. Additionally, we read every empirical article we could about best practices and guidelines for psychological interventions for children after a natural disaster. We also began an online fund-raising campaign to purchase relief supplies for our families in PR who were in desperate need of batteries, clothing, canned goods, hygiene supplies, medicine, etc. Therein lies *Lesson #2*—address basic needs first and provide a concrete way for interested colleagues and friends to help. Our professional circles responded within hours to donate—we were humbled and grateful.

Two-days post-disaster: Within two days, we had a phone call scheduled with Dr. Brymer to discuss best practice guidelines and ideas for serving children affected by Hurricane Maria in PR. The first author will never forget Dr. Brymer's first words to her on the phone: "How is your family doing? I can only imagine how hard this has been for you." Dr. Brymer proceeded to ask questions about the lay of the land (e.g., what we knew about conditions in PR, what were the most immediate needs, if we had communications with anyone who could connect us to an existing coordinated disaster response). There is *Lesson #3*—the importance of a well-coordinated and staged-implementation approach. That is, partnering with local agencies and national organizations carrying out relief work on the island, and focusing first on addressing basic needs such as shelter, food, water, and security first, providing normalization of common reactions after a natural disaster, quick coping skill tips, and self-care for front-line providers.

Given the unique context and level of destruction (an entire island, primarily Spanish speaking population, no communications or electricity),

a modified version of PFA, offered through an organization/platform with the ability to impact children island-wide (e.g., schools, churches) was recommended. Additionally, it was recommended that we land as soon as airports reopened, go in with a flexible agenda, bring all of the supplies (food, water) we would need in order to not be a burden to anyone, utilize a CBPA to better understand the unique needs and challenges on the island, tailor PFA to address the needs that our key stakeholders identified as the most pressing, and make sure to communicate that our team would provide ongoing support and that our commitment was long term. Dr. Brymer highlighted the importance of taking good field notes, adapting to the environment, taking care of each other as a team, and taking all this information back to tailor the next stages of this coordinated, staged response. Therein lies *Lesson #4*—there is no need to reinvent the wheel. Learn from others who have done this before you, flexibly adapt, and learn from the field.

First two weeks post-disaster: Our team took these guidelines and divided up tasks. One of us was in charge of purchasing supplies to take back to PR, two of us were in charge of connecting with potential stakeholders on the island, and others were in charge of exploring ways to leverage our existing funding mechanisms to support this work. Nine days post-disaster, the first author received a text from a graduate school friend and fellow Puerto Rican who happened to be visiting family on the island when Hurricane Maria struck. She and her husband had travelled to San Juan (the capitol of PR) to "command central," a building where all the heads of state had gathered to devise a plan given most communication systems were still not functioning properly. There, they ran into the Secretary of the Department of Education, explained their professional roles (clinical psychologist and neuroscientist) and asked, "how can we help?" Therein lies *Lesson #5*—ask how you can be of service and follow the need. The Secretary requested that they meet with the leader of the socio-emotional learning division of the PR-DE. She asked them to find experts who could help teachers, school staff, and children recover from the traumatic effects of Hurricane Maria. It was then when we received a text asking if our team would be willing to help—we had found our partnering organization, the PR-DE.

The next four days were spent communicating via Google Docs and spotty phone calls and text messages, drafting our ideas for a coordinated response to address trauma and chronic stress in educators, school staff, and children post-disaster. We listened to the needs and tailored our recommendations accordingly. More importantly, we made a commitment to be available any time during the day and connect them

with any resources that could help the island. Therein lies *Lesson #6*—in the aftermath of a disaster, your team needs to be available, responsive, an attentive to the survivors' immediate needs. This also served as an excellent learning opportunity for our graduate students and postdoctoral fellows, who saw a trauma-informed post-disaster response being coordinated in real time.

One and a half weeks post-disaster, our team had co-drafted a preliminary plan with the PR-DE which outlined: (a) meetings with partners on the island to assess needs and use this information to inform next steps; and (b) an initial trip 2–3 weeks post-disaster to provide PFA workshops to school teachers and staff to best support their students upon schools reopening. Our local partners on the island put us in contact with housing where first responders were staying and transportation with a PR-DE driver who knew the road conditions. To not burden our local partners, we made all travel arrangements ourselves once we had this information. Our team also rented a satellite phone to ensure that we would have communication while on the island. Therein lies *Lesson #7*—it is very important to solidify logistics ahead of time with local partners in order to ensure the safety and well-being of your team. It is also important to not overburden local partners and take the initiative to coordinate logistics yourself with the information provided, especially in a post-disaster context. Our airline also let us take six large containers with supplies, free of charge, after we explained the purpose of our trip. Therein lies *Lesson #8*—it never hurts to ask. The worst thing someone can say is 'no' and then you brainstorm another idea.

Three weeks post-disaster: On October 8, 2017, two and a half weeks after Maria, our team landed in PR. The images from the plane were harrowing. The trees had no leaves, the coastal sea water (usually a gorgeous blue and turquoise) was brown, broken utility poles were blocking the streets, trash was everywhere, thousands of houses had exposed rooftops and blue tarps. It was unlike anything we had ever witnessed. Knowing the personal connection some of us had (two of us were flying "back home"), our team made sure to provide each other with support and quick "check-ins." Therein lies *Lesson #9*—stay attuned to your team. Provide ongoing support and breaks whenever needed. Upon landing, our first task was clear. Deliver supplies to our communities on the island. Thankfully, the first author's family members were gracious to offer us transportation that first day. They brought us a cold bottle of water (a precious luxury given the circumstances) and asked that we please drink it even though we insisted they should have it instead. Upon arriving to their home, they had cooked a traditional Puerto Rican meal for us on a

gas stove, even though they had no electricity or running water. They showed us a flower that had bloomed and reiterated how “Puerto Rico se levanta” (“Puerto Rico rises”). Therein lies *Lesson #10*—Puerto Ricans (and likely most post-disaster survivors) are a compassionate and courageous people, and it is important to respect cultural norms. For example, it is considered impolite to not eat or drink something when offered, even when you know it is coming from very limited supplies. It is equally important to replenish these supplies and assess what additional needs you could help meet.

On Monday, October 9, 2017, our team met with the PR-DE division leaders: head of socioemotional learning, head of social workers, head of psychologists, chief academic officer, and other key staff. In a conference room with no electricity, we introduced ourselves and began by asking how they and their families were doing. Many had traveled hours, utilizing what little gasoline they had left to come to this meeting. Others had damaged homes and had not had contact with friends or family. Others were grateful because they had not had major damage, but worried about their neighbors and friends. We listened and provided support. PFA had already begun. We then noticed a common theme emerging: “Our teachers and school staff need help. I need help. We all do.” Upon further inquiry we learned that they were all feeling emotionally overwhelmed, stressed, worried about the future, having difficulty sleeping, and feeling anxious.

PR-DE leadership mentioned that the number one priority of these initial PFA trainings should be to provide self-care strategies and tools for teachers and school staff so that they could cope with their own distress first and have the necessary tools to help students upon their return to school. They also requested that these workshops be delivered across the entire island so that everyone, not just those in the metropolitan area of San Juan, could benefit. Finally, they reported concerns with the logistics of delivering these workshops. Where would they be held? There was no electricity for PowerPoint. There was no running water in the schools for bathrooms to function or coffee and snacks to give to participants. How would the word be spread? Internet was spotty in most parts of the island, cell phones had limited signal, no one was checking email. Roads were destroyed in most rural and mountainous areas of the island. How would people transport themselves? Our team validated these concerns and provided a safe space in which to have these difficult conversations. Not surprisingly, the answers to these questions emerged from the PR-DE staff themselves. One of the leaders suggested that one workshop be held in each region of the island (north, south, east, west) and that a school or

community center with access to water or a generator be used. Another leader suggested that a hand-written paper and pen itinerary be agreed upon before the meeting ended, and then each leader would drive to their respective towns and spread the news about the workshops via word-of-mouth. We also reassured the team that we did not require PowerPoint, a microphone, or anything else—we were happy to deliver a quality workshop without any technology. To address the need to reach the most teachers and school staff possible, we offered to give a 90-minute workshop in the mornings for anyone to attend, and a four-hour workshop in the afternoons for school social workers, counselors, and psychologists to take the workshop and also learn how to replicate it in their respective schools ("train-the-trainer" approach). All parties agreed, an agenda was written, and everyone got to work on their assigned duties.

Specifically, our tailored PFA workshop would have the following goals: (a) provide information about common reactions, across developmental levels, after a natural disaster; (b) offer basic coping skills to use with oneself and with students (e.g., breathing training, mindfulness-based exercises, and progressive muscle relaxation); (c) talk about secondary traumatic stress and self-care strategies; and (d) practice as a group and obtain feedback on additional resources and tools they would like. Therein lies *Lesson #11*—using a CBPA, in which key stakeholders offer their concerns, needs, ideas, and help co-design a project together with the implementing team, offers a fruitful and respectful approach to post-disaster intervention planning. Information learned from these key stakeholder meetings is then used by the implementing team to flexibly adapt and tailor their approaches to best fit the local context. Furthermore, teams must be willing and able to deliver workshops without the use of technology (yes, it is possible—this coming from a team spearheading the delivery of trauma-focused psychotherapy via telehealth!)

Over the course of the next four days, our team offered six workshops across six regions of the island (Humacao, San Juan, Bayamón, Arecibo, Mayagüez, and Ponce). We packed enough water and protein bars for the day to make sure we were not a burden to anyone. Our driver was amazing, and we could not have done this without him. The road conditions were often dangerous (debris, flooding, collapsed bridges, and long lines to get gasoline) thus highlighting the importance of traveling with trained drivers. We were expecting only a few people to show up to these trainings. To our surprise, word of mouth still works! A total of 552 teachers and school personnel participated in our workshops (45% in the 90-minute general workshop for teachers/school staff and

55% in the 4-hour train-the-trainer workshop for social workers, counselors and psychologists). Upon arriving to these schools, people were waiting in lines to get in. The most common comment we heard was how grateful they were to get to "put on my work clothes again and come to work." We provided times throughout the workshops for people to gather, embrace, and share stories. Many were seeing their co-workers for the first-time post-hurricane. PFA had begun at the door with people connecting and offering each other social support. Our PR-DE team did an amazing job collecting donations and offering food and basic canned good items to the school staff, also addressing access to basic needs. The workshop was also used as a time for PR-DE leadership to communicate important information to their staff (e.g., school closures and dates of reopening; address payroll concerns; share information and resources for local water, food, and clothing distribution sites; distribute application guidelines for FEMA assistance). Furthermore, some schools turned on their generators and provided warm coffee and a light snack to their guests. Therein lies *Lesson #12*—social support, connection, and access to information and resources are powerful. A large part of PFA is allowing space for these connections to naturally occur.

During the workshops, our team learned the importance of knowing all of the material by memory (no PowerPoint), incorporating activities that engaged the group as a whole (lecture format was not appropriate or engaging), delivering the message in easy to follow bullet points, accompanied by many practical coping skills, and allowing times for breaks. At the end of our workshops, we emphasized that our team would continue collaborating with the PR-DE long term to provide resources and additional workshops. Attendees expressed their gratitude for this commitment, saying that they appreciated we were not just "helicoptering in." Furthermore, a dozen or so social workers approached us to ask, "how we can be a part of your team?" We obtained their contact information and made sure to incorporate them in our other phases (discussed below). Therein lies *Lesson #13*—it is important to make known your commitment to work together in the long term, to the extent that it is possible, especially within post-disaster contexts where much of the aid comes in the immediate aftermath and then dissipates over time despite the great need. At the end of our trip, we offered similar workshops at local churches and at a nursing home. We met with other stakeholders (e.g., primary care providers, other academics on the island). We conducted one last meeting with key stakeholders before leaving, thanking them for their time, service, and courageous work and setting a follow up call to continue to work together.

Phase 2: Short-term Recovery and Rebuilding (Six months post-disaster)

Upon our return from that initial trip, our team met multiple times to discuss our experiences, share what he had learned, and our ideas for next steps based on our field notes. We also continued weekly conversations via text message and phone calls with our key partners on the island. During one of our initial follow-up calls with the leader of the socioemotional learning division for the PR-DE expressed the need for fact sheets and manuals about common traumatic-stress responses in students for teachers and parents to use in Spanish. Our bilingual team gathered all available resources we found online in Spanish (see www.nctsn.com for excellent resources) as well as translated those that were not available and got feedback from bilingual Puerto Rican professionals on the accuracy of the translation. Therein lies *Lesson #14*—adapt your resources and materials to fit the cultural and linguistic context and make sure native speakers and professionals review and approve the content before wide-spread dissemination. We created an online cloud in which anyone could access these resources. Our team also video-recorded the PFA workshops provided in PR and with the help of our institution, edited and uploaded to this cloud for any PR-DE school staff member to access.

By the first month after our on-the ground- PFA workshops, we were informed these had been replicated by our "champion social workers"—the social workers that expressed interest in being part of our team during Phase 1—with over 6,000 school staff across the island. Our team started a group text with these champion social workers to better understand their needs and observations in the field. One of the themes that emerged was a need for consultation calls to troubleshoot questions and get additional resources. This resulted in a total of five consultation calls delivered over the following six months, in which they shared how their replication workshops were going, what questions the school staff were asking, what resources they wish they would have, and what additional training they felt they needed to best support their students post-hurricane. Of note, due to the poor Internet connection even six months post-disaster, these consultation calls were used using free apps with low bandwidth (e.g., WhatsApp—application commonly used internationally) or by providing our partners with a free conference call number. Therein lies *Lesson #15*—a CBPA is crucial to continuing to understand the needs of the target population, barriers encountered in the short-term recovery and rebuilding phase, and to best tailor future initiatives and trainings to these needs. For example, during one of these calls, we learned that social workers were beginning to identify children

with changes in behaviors, aggression, suicidal ideation, and school-avoidance approximately three months after the hurricane. These students were not previously identified as having these problems thus representing a marked change in behavior post-hurricane. The social workers wondered what additional strategies could be used to most effectively help these children.

During this time, the PR-DE set as one of its priorities conducting an island-wide needs assessment of all public-school students and teachers to better understand the unique disaster exposure and socio-emotional needs of each school and best direct the limited available psychological resources to those schools in most need. The PR-DE asked our team for guidance on developing a needs assessment tool. We did what we always do when we are not sure—contacted the experts. Within days we consulted with post-disaster assessment experts who provided much needed guidance on best-practice recommendations for post-disaster mental health screening. Guided by the literature, it was recommended the PR-DE use the *National Child Traumatic Stress Network Hurricane Assessment and Referral Tool* (Kronenberg et al., 2010) which was developed after the 911 attacks in New York and adapted for use after various hurricanes (2004 Florida hurricanes, Hurricane Katrina/Rita). The tool assesses predictors of post-disaster recovery such as disaster exposure, loss, and access to social support, as well as common psychological outcomes such as posttraumatic stress and depression.

Our team obtained permission to use the tool, transform it into a self-report format, and translate it to Spanish. We then provided this tool to the PR-DE who administered it as part of a wider initiative, to all students and teachers on the island. Over 96,000 students completed the needs assessment, becoming the largest post-disaster mental health screening effort in U.S. history with the largest sample of Hispanic youth affected by a natural disaster to our knowledge (Orengo-Aguayo, Stewart, de Arellano, Suarez-Kindy, & Young, 2019). Results of this needs assessment will inform targeted and sustainable evidence-based practices aimed at improving mental health outcomes for PR's youth based on the unique needs identified. Interestingly, this island-wide needs assessment was conducted with limited funding, relied on school and district staff who donated their time to hand deliver packets to schools and process the surveys, and involved committed PR-DE leadership who saw the importance of following best-practice screening guidelines to inform post-disaster interventions for children. Therein lies *Lesson #16*—where there is a will, there is a way. When collaborative partnerships are established in

which expertise can be freely exchanged with the common goal of service and doing good, big ideas can turn into big deliverables.

Our team continued consultation calls with Dr. Brymer. Based on our conversations with our champion social workers, it became clear that they were wanting additional tools to address posttraumatic stress reactions and suicidality among students. We began planning our next workshop in PR, *Skills for Psychological Recovery (SPR)*, which aimed to meet the need for a Tier II intervention. During one of our calls, Dr. Brymer connected us to a child and adolescent psychiatrist in PR and representative of the American Academy of Child and Adolescent Psychiatry (AACAP) local chapter on the island. This psychiatrist and the local AACAP chapter were very interested in partnering with ongoing efforts to promote mental health for children on the island. Both her team and ours had identified a need to address suicide among children and adolescents, which can increase after a disaster. We agreed that her team would develop a suicide and crisis management workshop, tailored for school social workers and psychologists in PR, and co-train with us during our next trip. Therein lies *Lesson #17*—divide and conquer! Partnering with other professionals who have expertise in different areas is crucial to a successful post-disaster response. Furthermore, when working in a different country or region from yours, it is important to seek and honor the local expertise and rely heavily on it for guidance.

Our team translated the SPR manual and worksheets to Spanish, prepared the workshop with input from our champion social workers, and in conjunction with our local partners offered a three-day workshop to 48 school social workers and psychologists from April 16–18, 2018 (seven months post-disaster). We began each day with brief check-ins and group-based interactive activities, introduced an SPR skill and role-played in groups using post-disaster scenarios that our champion social workers had identified in their schools. The team of child and adolescent psychiatry residents and their attending supervisor also provided a training on suicide and crisis management and used interactive role-plays to put the concepts into practice. Once again, our team noted the value of incorporating trainees (in this case, psychiatry residents) in post-disaster trainings as a great opportunity for real-time learning. Interestingly, participants noted that one of their favorite parts of the workshop was interacting with the psychiatrists. Many social workers and psychologists said that they had never met one in person and wish they had access to an interdisciplinary consultation team in their schools which included a psychiatrist. Therein lies *Lesson #18*—interdisciplinary collaborations and partnerships are key in post-disaster intervention. Incorporating diverse professional

perspectives and ensuring school-personnel have access to interdisciplinary consultations is desired and important (Orengo-Aguayo, Stewart, Martínez-González, Suárez-Kindy, Christian-Herrero, & Rivera-Colón, 2019).

Halfway through the SPR training, an island-wide power outage occurred. The entire room went dark and our participants had various common reactions (panic, laughter, crying, freezing, and fleeing). It is important to highlight that half of the participants had only recently regained electricity in their own homes and half still did not have electricity. As such, this was a highly triggering event. Our team used this experience to model SPR skills in a compassionate and caring manner. As a group, we used what we had learned in the "Managing Reactions" module to do a breathing exercise. Then, the audience began saying things such as "we won't have power now for months," "I will never be able to relax again." We decided to focus on the "Helpful Thinking" module and practice thinking in a more helpful way, via use of cognitive triangle exercises, to help us gain a little distance from these unhelpful thoughts. We invited participants to share which other SPR skills they thought would be useful in this situation and invited to role-play them with their table. Therein lies *Lesson #19*—experiential learning is powerful. Use what is showing up in the room, in a compassionate and respectful manner, to illustrate the skills you are trying to teach. Not surprisingly, participants reported this was both the worse part (it was scary to have the power go out) and best part (I realized I could get through it using these skills) of the workshop.

Since the beginning of our post-disaster response in PR, our team developed a two-page document highlighting our team's goals for PROMISE, our preliminary results and findings, and next steps. It was designed to inform our local partners on the island of the progress being made and to highlight the important work we were accomplishing together (key aspect of a CBPA framework). Around this time (approximately five months post-disaster) our partners, the NCTSN, received this fact-sheet and learned all that we had accomplished in such a short amount of time. We were invited to present our work and recommendations for assisting the children in PR at a congressional panel on Capitol Hill. Therein lies *Lesson #20*—spread the word. Share your findings in a simple, easy-to-understand format (e.g., 1–2 page fact sheets) with community partners, funders, friends, colleagues, social media, etc. As academics we are taught from early on to share our work via peer-reviewed journals and book chapters exclusively. These are very important of course as they help advance the scientific field. However, in order to make a broader

impact, it is important to also share your work through other mediums that better reach the real world. Additionally, when called to present at big arenas (such as in front of congress), say yes! Collaborate with individuals who have done it before and can help you prepare. In our case, our preparation with senior policy advisors and leaders at the National Center for Child Traumatic Stress at UCLA-Duke, was key. Furthermore, us junior faculty (first and second authors) learned another important *Lesson #21*—just because you are early in your career does not mean that you cannot make a broad contribution or impact to the field. Be courageous, seek guidance, and sit at the table.

Phase 3: Long-term recovery phase (1-year post-disaster)

Nine months post-disaster, our team began having regular conversations with psychologists and psychiatrists on the island. Specifically, we began getting a deeper understanding of the mental health system in PR, strengths, barriers, and access to evidence-based trauma treatment in particular. We found that just as in the mainland US, there are significant mental health professional shortage areas, particularly in the rural and western part of the island. Furthermore, even before the hurricane, PR had been experiencing a major exodus of professionals to the mainland US due to more than a decade-long financial recession and limited employment opportunities. Hurricane Maria exacerbated the professional "brain drain" and has left the island with a significant shortage of psychiatrists and psychologists. Of those on the island, only a few in the metropolitan San Juan area are certified in evidence-based trauma-focused therapies.

Our team began having close conversations with the PR-DE head of school psychologists to better understand the school psychologists' roles, challenges, needs, and strengths. She identified the need and interest for specialized evidence-based trauma-focused psychotherapy training. Given our team's expertise in delivery of TF-CBT in the mainland US (the third author is a Nationally Certified TF-CBT trainer; the first author has co-delivered trainings of TF-CBT in Spanish with the third author), our team began devising a culturally and linguistically tailored TF-CBT training for PR-DE psychologists. The first author translated all materials into Spanish, made sure that they were appropriate for the Puerto Rican context, and our team developed an accompanying toolkit with session agendas, worksheets, and linguistically tailored self-report assessments, all in Spanish. Our team is also in the process of professionally translating TF-CBT 2.0 Web, an online training site for TF-

CBT, to Spanish to make this resource widely available to Spanish-speaking professionals across the world (https://tfcbt2.musc.edu).

Our team also set up several pretraining calls to get to know the psychologists who were interested in participating, better understand the needs of students from the psychologists' perspectives, understand their strengths and needs as professionals, and explain the TF-CBT Learning Collaborative Model. Through this process, we adapted our materials, incorporated additional relevant resources, and tailored our first TF-CBT learning session. Therein lies *Lesson #22*—continuing to use a CBPA throughout the course of a project. Assessing current local resources before implementing a new intervention provides important context as to the gaps and resources you can draw from. Additionally, just because an intervention has been widely tested and disseminated in the US does not mean that it is ready for immediate transportability in a new context. We had to invest significant time in properly translating and tailoring TF-CBT materials to the local Puerto Rican context. This process is ongoing and will continue to incorporate clinician feedback as the training progresses.

One year after we first landed in PR, we were back on the island this time to help training school psychologists in the delivery of TF-CBT. Nineteen psychologists and their leader participated in the two-day learning session (i.e., training) with all reporting that it was interactive, useful, comprehensive, and culturally sensitive. The psychologists were very interested in the support provided through the Learning Collaborative model, which includes not only the initial training, but an additional follow-up learning session as well as 6–8 months of follow-up consultation calls. During this trip we also met with our key PR-DE stakeholders to make sure their needs were being addressed and our model could be tailored appropriately. During this meeting, one of our partners described it like this: "From the moment we partnered with you guys we felt taken care of, like we were with family. You didn't impose yourselves, but you also didn't leave us to figure out everything on our own. Our relationship has developed organically." Therein lies *Lesson #23*—your relationships are as strong as your foundation. Investing early on in these community partnerships, cultivating them, making them a priority results in long-lasting partnerships that can make a difference.

After we returned from this third trip, we began our biweekly consultation calls with the PR-DE psychologists. One to two months after our initial training, the psychologists had begun conducting evidence-based trauma-focused assessments with identified children, began identifying children who would be appropriate for TF-CBT, and began seeing TF-CBT cases. During our calls we encourage and praise our

partnering psychologists for their brave and hard work. We remind them of the difference they are making in children's lives. They also remind us why we do this work to change the world one child at a time. Our team has now partnered with co-creators of Cognitive Behavioral Intervention for Trauma in Schools (CBITS) and Bounce Back (BB) in an effort to train future mental health professionals in PR in these additional, evidence-based Tier III interventions.

Conclusions

This paper described the process by which our team established a partnership with the PR-DE to implement a three-phase, trauma-focused disaster behavioral health model, informed by best practice post-disaster and implementation science guidelines, beginning immediately after Hurricane Maria impacted PR. Given the unique nuances of implementing post-disaster interventions within an educational system island-wide, a CBPA, grounded on dissemination and implementation science (EPIS framework: Exploration, Preparation, Implementation, and Sustainment; Aarons, Hurlburt, & Horwitz, 2011), was used to help guide our post-disaster behavioral health response.

As outlined in Table 2, 11 of our 23 lessons learned centered around the importance of following the principles of a CBPA throughout each implementation phase, but particularly during Exploration and Preparation. Specifically, we learned of the importance of establishing collaborative partnerships, assessing stakeholders' needs, co-designing project initiatives, tailoring both the interventions and implementation procedures based on iterative feedback, learning from local partners' expertise, sharing results throughout, and committing long term to addressing the mental health needs of Puerto Rican children post-disaster. Six of the lessons learned centered on the importance of following established post-disaster intervention guidelines and recommendations of experts. Having a well-coordinated, staged-implementation approach has contributed to the sustainability and success of PROMISE. Four lessons highlighted the importance of being flexible, adapting all materials and implementation procedures to the local context and across time, and being creative in the use of resources and troubleshooting. Finally, one lesson learned highlighted the importance of self-care when conducting this type of work and another on having courage to proceed despite the challenges. These findings align with other projects using a CBPA (e.g., Becker et al., 2009).

A year and a half later, we are learning of the importance of continuing to adopt a CBPA during the sustainability phase of

implementation to better understand the unique challenges and resources of our partners in sustaining these psychological interventions. For instance, a need for hiring additional school-based psychologists, providing general trauma training to school nurses, social workers, and school staff, providing guidance of evidence-based practice trauma screening have all been identified by our partners as important next steps in the sustainability of a trauma-informed post-disaster school response.

Implications for practice, training, policy, and future research

Our work with the PR-DE is ongoing with plans already in motion to continue building local capacity for evidence-based trauma-focused services, build trauma-informed schools and communities, and incorporate technology (e.g., telehealth) to reduce barriers in access to mental health care. We continue to partner with other local agencies because we have learned there is power in collaboration. In presenting this work at various conferences, audience members have reacted most strongly to two things: (a) the ability to implement an evidence-based trauma-informed intervention model in *real time* post-disaster; and (b) the ability to *merge clinical practice and program evaluation* to produce real-world change. The implementation of PROMISE highlights the promise—no pun intended—of academics, community partners, and interdisciplinary mental health providers coming together, sharing ideas, and committing to working together with limited resources to make a real impact in children's lives. As our "lessons learned" highlighted throughout this manuscript suggest, our ability to carry out this work relied heavily on our ability to seek guidance, adapt flexibly, and commit to making a difference one step at a time using a CBPA framework.

Our recommendation to teams interested in carrying out this work is to not work in silos. Rather, connect with experts or others who have done the work before, seek guidance, and adopt a "how can I serve?" mindset first. By identifying needs using a CBPA, the project goals will write themselves and your team will have the most potential to truly make a lasting difference. We also recommend that all procedures, protocols, and approaches be grounded in scientific evidence and empirical studies. In the absence of controlled research studies, we recommend that expert consensus on best practice guidelines be followed. Furthermore, we encourage teams to consider how existing funding mechanisms could be leveraged to support post-disaster work. In cases in which this is not possible, starting small through foundation or institutional service or small pilot grants, may help subsidize travel and materials to begin a small-scale

implementation project that can be used to learn and tailor future initiatives.

We also recommend that throughout all stages of work (from initial meetings to implementation of trainings), detailed field notes be taken and referenced often. Our team heavily relied on our lessons learned from the field to improve our next phases and tailor materials and approaches accordingly. We also recommend that program evaluation data be used to inform future applications for service (e.g., SAMHSA) and research grants (e.g., NIMH), as pilot data to justify controlled research studies evaluating the effectiveness of these interventions. For mentors, we strongly encourage you to incorporate your students in post-disaster work and encourage them to pursue this type of work. Most of us entered the mental health field to make a difference in the world—to help others. Rigorous research programs are excellent at teaching strong methodology and scientific analysis, yet students often find themselves disconnected from the real-world impact of their work. We contend that bringing graduate students, psychiatry residents, and post-doctoral fellows along in this process, helping them have seat at the table in exchanging ideas, letting them observe stakeholder meetings and the development of community partnerships, and allowing them to observe these real-time implementation projects will encourage the next generation of scientists to take on these high-risk, high-reward projects with the greatest potential to result in real-world change.

An additional unintended component of our work was our interaction with the press and media. Our team received multiple requests for interviews with national and local press, as well as for local and international radio and news outlets. As academics, we are often taught to avoid interactions with the press. We embraced this as an opportunity to communicate the great needs Puerto Ricans were facing, raise awareness about trauma-informed practices, and highlight the value of putting service first. Consistent with our lessons learned, we educated ourselves on the best ways to speak with the press and read literature on communicating science effectively and clearly to lay audiences. The response was surprising—all articles published were accurate, respectful, and resulted in additional partnerships that would not have been possible if those articles had not been published. As an example, one of our participants at a PFA workshop at a local church in PR told us that she found out about the workshop through an article that someone had posted on social media. Our invitation to present on Capitol Hill was also due in part to articles about our team's work. We later found out that our presentation was instrumental in providing evidence to Congress for the need for additional

funding to support mental health services for the children of PR. Our recommendation is that graduate programs provide workshops on communicating science to the media and lay audiences. This will result in scientists who can communicate their findings more effectively, build better partnerships, and help bridge the gap between the academic “ivory tower” and the real world.

Our final recommendation is simple—it is okay to dream. Many teams are not as successful as they could be because the first response to new ideas is often “that won’t work” or “it’s too risky.” Our team learned that dreaming is the way to go. Then, you create a phased approach to achieve the end goal with feasible and achievable middle steps. It is also okay to pursue work that is personal. We do our best when we are driven by what matters most to us—our core values. We are excited to continue this journey towards helping the children of PR recover from the effects of Hurricane Maria.

Table 1: Phases of Post-Disaster Recovery and Psychological Interventions

	Phase 1: Immediate Aftermath	Phase 2: Short-term Recovery and Rebuilding	Phase 3: Long-term Recovery
Goals	• Restoring access to basic needs • Promoting a sense of safety and security • Connecting with social supports • Reducing or preventing long-term distress	• Tier I: Universal outreach, public health information, psychoeducation • Tier II: Targeted coping skills for at risk groups • Tier III- Referral to mental health treatment for those with unremitting moderate-to-severe distress	• Continue Tier I and II level intervention as needed • Offer evidence- based cognitive behavioral trauma/grief interventions to those with moderate-to-severe trauma-related symptoms
Interventions	*Psychological First Aid* (PFA; Brymer et al., 2006) www.nctsn.org	*Skills for Psychological Recovery* (SPR; Berkowitz et al., 2010) www.nctsn.org	*Cognitive Behavioral Intervention for Trauma in Schools (CBITS; Jaycox, Langley & Hoover, 2018)* *http://cbitsprogram.org* *Trauma-Focused Cognitive Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2017)* *https://tfcbt.org*
Components	Eight core actions: • Contact and Engagement • Safety and Comfort • Stabilization • Information Gathering • Practical Assistance • Connection with Social Supports • Information on Coping • Linkage with Collaborative Services.	Six core skills: • Information gathering • Problem-solving skills • Positive activities • Managing reactions • Helpful thinking • Rebuilding healthy social connections.	**CBITS:** • Normalizing education about common reactions to stress and trauma • Coping skills such as relaxation, how to challenge and replace upsetting thoughts, and problem solving. • Processing traumatic memories and grief **TF-CBT:** *Eight core components:* • Psychoeducation and parenting skills • Relaxation • Affective expression and modulation

DOI: 10.58464/2168-670X.1399

			• Cognitive coping • Trauma Narrative • In vivo exposure • Conjoint sharing of the Trauma Narrative • Enhancing Safety
Providers	Lay providers (e.g., first responders) or mental health or other health workers (e.g., social workers, counselors, victim advocates), or paraprofessionals (e.g., disaster crisis counselors)	Mental health or other health workers (e.g., social workers, counselors, victim advocates), or paraprofessionals (e.g., disaster crisis counselors)	Licensed mental health professionals (e.g., clinical psychologist, clinical social workers, professional counselors)
Target Population	Children and adults	Children and adults	Children and adolescents*
Delivery Format	Individual or group	Individual or group	**CBITS:** Group-based (also has some individual student, parent and teacher sessions) **TF-CBT:** Individual (also has parent sessions and conjoint sessions)
Location	Emergency shelters, schools, hospitals, primary care clinics, faith-based organizations, and other community centers	Emergency shelters, schools, hospitals, primary care clinics, faith-based organizations, and other community centers	Private location in the school, mental health clinic or community.
Duration	Typically, 1 to 3 sessions that can be a few minutes to an hour. Adjusted based on need.	1 to 5 sessions depending on need	**CBITS:** 10 group sessions (6-8 children per group), 1-3 individual student sessions, 2 caregiver meetings, and an optional school staff information session. **TF-CBT:** 12-16 individual and parallel caregiver sessions, with a longer duration for complex trauma.

Note. *There are evidence-based treatments (EBTs) for adults with trauma such as Prolonged Exposure and Cognitive Processing Therapy. We only summarize EBTs for children and adolescents in this table.

Table 2: Summary of Lessons Learned by Post-Disaster Phase and Theme			
	Phase 1: Immediate Aftermath	**Phase 2: Short-term Recovery and Rebuilding**	**Phase 3: Long-term Recovery**
Use a Community Based Participatory Approach (Build on strengths and resources, active, collaboration, bi-directional learning, follow the need, service, iterative revision of processes, sharing of results, long-term commitment; Israel et al., 2003, 2005)	*L1:* Partner with experts who can provide guidance. *L10:* Post-disaster survivors are a compassionate and courageous people and it is important to respect cultural norms. *L11:* Key stakeholders offer their concerns, needs, ideas, and help co-design a project together with the implementing team offers a fruitful and respectful approach to post-disaster intervention planning. *L13:* Make known your commitment to work together in the long-term.	*L15:* Continue to understand the needs of the target population to best tailor initiatives and trainings. *L16:* Establish collaborative partnerships in which expertise can be freely exchanged with the common goal of service and doing good. *L17*: Partnering with other professionals who have expertise in different areas is crucial to a successful post-disaster response. *L18:* Interdisciplinary collaborations and partnerships are key in post-disaster intervention. *L20:* Share your findings in a simple, easy-to-understand format broadly.	*L22:* Continuing to assess local resources before implementing a new intervention provides important context as to the gaps and resources you can draw from. *L23:* Investing early on in community partnerships, cultivating them, making them a priority results in long-lasting partnerships that can make a difference.
Follow Post-Disaster Guidelines (Address basic needs first, provide tiered-level interventions tailored to need, follow lessons learned from prior disaster experts)	*L2:* Address basic needs first. *L3:* Have a well-coordinated and staged-implementation approach. *L4:* Learn from others who have done this before you. *L5:* Ask how you can be of service and follow the need.		

	L7: Solidify logistics ahead of time with local partners in order to ensure the safety and well-being of your team. Take the initiative to coordinate logistics yourself with the information provided to avoid overburdening local partners. *L12:* Social support, connection, and access to information and resources are powerful.		
Flexibility, Adaptability and Creativity	*L6:* In the aftermath of a disaster, your team needs to be available, responsive, an attentive to the survivors' immediate needs. *L8:* It never hurts to ask. The worst thing someone can say is 'no' and then you brainstorm another idea.	*L14:* Adapt your resources and materials to fit the cultural and linguistic context. *L19:* Experiential learning is powerful. Use what is showing up in the room, in a compassionate and respectful manner, to illustrate the skills you are trying to teach.	
Self-Care	*L9:* Stay attuned to your team. Provide ongoing support and breaks whenever needed.		
Courage			*L21:* Just because you are early in your career does not mean that you can't make a broad contribution or impact to the field. Be courageous, seek guidance, and sit at the table.

References

Aarons, G.A, Hurlburt, M., & Horwitz, S.M. (2011). Advancing a conceptual model of evidence-based practice implementation in public service sectors. *Administration and Policy in Mental Health and Mental Health Services Research, 38*, 4–23. doi:10.1007/s104 88-010-0327-7

Akoury-Dirani, L., Sahakian, T.S., Hassan, F.Y., Hajjar, R.V., & Asmar, K.E. (2015). Psychological First Aid training for Lebanese field workers in the emergency context of the Syrian refugees in Lebanon. *Psychological Trauma: Theory, Research, Practice, and Policy, 7*, 533–538. doi:10.1037/tra0000028

Allen, B., Brymer, M.J., Steinberg, A., Vernberg, E.M., Jacobs, A., Speier,
A.H. & Pynoos, R.S. (2010). Perceptions of Psychological First Aid among providers responding to hurricanes Gustav and Ike. *Journal of Traumatic Stress, 23*, 509-513. doi:10.1002/jts.20539

Arnberg, F. K., Hultman, C. M., Michel, P. O., & Lundin, T. (2012). Social support moderates posttraumatic stress and general distress after disaster. *Journal of Traumatic Stress, 25*, 721–727. doi:10.1002/jts. 21758

Becker, C.B., Stice, E., Shaw, H. & Woda, S. (2009). Use of empirically supported interventions for psychopathology: Can the participatory approach move us beyond the research-to-practice gap? *Behaviour Research and Therapy, 47*, 265–274. doi:10.1016/j.brat.2009.02. 007

Becker-Blease, K. A., Turner, H. A., & Finkelhor, D. (2010). Disasters, victimization, and children's mental health. *Child Development, 81*, 1040–1052. doi:10.1111/j.1467-8624.2010.01453.x

Berkowitz, S., Bryant, R., Brymer, M., Hamblen, J., Jacobs, A., Layne, C., Macy, R., Osofsky, H., Pynoos, R., Ruzek, J., Steinberg, A., Vernberg, E., & Watson, P. (2010). *The National Center for PTSD & the National Child Traumatic Stress Network, Skills for Psychological Recovery: Field Operations Guide.*

Blachman-Demner, D.R., Wiley, T.R.A., & Chambers, D.A. (2017). Fostering integrated approaches to dissemination and implementation in community engaged research. *Translational Behavioral Medicine, 7*, 543–546. doi: 10.1007/s13142-017-0527-8

Bonnano, G. A., Brewin, C. R., Kaniasty, K., & Greca, A. M. L. (2010). Weighing the costs of disaster: Consequences, risks, and resilience in individuals, families, and communities. *Psychological Science in the Public Interest, 11*, 1–49. doi:10.1177/1529100610387086

Brown, C.H., Curran, G., Palinkas, L.A., Aarons, G.A, Wells, K.B., Jones, L., Collins L.M … . et al. (2017). An overview of research and evaluation designs for dissemination and implementation. *Annual Review of Public Health, 38*, 1–22. doi:10.1146/annurev-publhealth-031816-044215

Brown, R.C., Witt, A., Fegert, J.M., Keller, F., Rassenhofer, M., & Plener, P.L.. (2017). Psychosocial interventions for children and adolescents after man-made and natural disasters: A meta-analysis and systematic review. *Psychological Medicine, 47*, 1893–1905. doi:10.1017/S0033291717000496

Brymer, M., Jacobs, A., Layne, C., Pynoos, R., Ruzek, J., Steinberg, A., Vernberg, E. & Watson, P. (National Child Traumatic Stress Network and National Center for PTSD), *Psychological First Aid: Field Operations Guide*, 2nd Edition, July, 2006. Retrieved from www.nctsn.org and www.ncptsd.va.gov

Brymer, M. J., Reyes. G., & Steinberg, A.M. (2012). Disaster behavioral health for children and adolescents: Best practices for preparedness, response, and recovery. In J. L. Framingham and M. L. Teasley (Eds.), *Behavioral Health Responses to Disasters* (pp. 143–158). New York: Taylor and Frances Group.

Cary, C.E. & McMillen, J.C. (2012). The data behind dissemination: A systematic review of trauma-focused cognitive behavioral therapy for use with children and youth. *Children and Youth Services Review, 34*, 748–757. doi:10.1016/j.childyouth.2012.01.003

Cohen, J.A., Mannarino, A.P., & Deblinger, E. (2017). *Treating trauma and traumatic grief in children and adolescents* (2nd ed.). New York: Guilford Press.

de Arellano, M.A., Waldrop, A.E., Deblinger, E., Cohen, J.A., & Danielson, C.K., Mannarino, A.P. (2005). Evidence-based treatment for victims of child maltreatment: A community-based demonstration. *Behavior Modification, 29*, 130–155.

de Arellano, M.A., Lyman, R.D., Jobe-Shields, L., George, P., Dougherty, R.H., & Daniels, A.S. (2014). Trauma-focused cognitive-behavioral therapy for children and adolescents: Assessing the evidence. *Psychiatric Services, 65*, 591–602. doi:10.1176/appi.ps.201300255

Dean, K.L., Langley, A.K., Kataoka, S.H., Jaycox, L.H., Wong, M., & Stein, B.D. (2008). School-based disaster mental health services: Clinical, policy, and community challenges. *Professional Psychology: Research and Practice, 39*, 52–57. doi:10.1037/0735-7028.39.1.52

Dieltjens, T., Moonens, I., Van Praet, K., De Buck, E., & Vandekerckhove, P. (2014). A systematic literature search on Psychological First Aid:

Lack of evidence to develop guidelines. *PLoS ONE, 9*, 1–13. doi:10.1371/journal.pone.0114714

Evans, S. W., & Weist, M. D. (2004). Implementing empirically supported treatments in the schools: What are we asking? *Clinical Child and Family Psychology Review, 7*, 263–267. doi:10.1007/s10567-004-6090-0

Federal Emergency Management Agency-FEMA (2018). *2017 Hurricane Season FEMA After-Action Report*. Retrieved from https://www.fema.gov/media-library-data/15336432621956d1398339449ca85942538a1249d2ae9/2017FEMAHurricaneAARv20180730.pdf

Felix, E., Hernandez, L.A., Bravo, M., Ramirez, R., Cabiya, J., & Canino, G. (2011). Natural disaster and risk of psychiatric disorders in Puerto Rican children. *Journal of Abnormal Child Psychology, 39*, 589–600. doi:10.1007/s10802-010-9483-1

Felix, E.D., You, S., & Canino, G. (2013). School and community influences on the long term postdisaster recovery of children and youth following hurricane Georges. *Journal of Community Psychology, 41*, 1021–1038. doi:10.1002/jcop.21590

Fischer, H.W. (2003). The sociology of disaster: Definitions, research questions, & measurements – continuation of the discussion in a post-September 11 environment. *International Journal of Mass Emergencies and Disasters, 21*, 91–107.

Fisher, J. R., & de Mello, M. C. (2011). Using the World Health Organization's 4S-Framework to Strengthen National Strategies, Policies and Services to Address Mental Health Problems in Adolescents in Resource-Constrained Settings. *International Journal of Mental Health Systems, 5*, 1–13. doi:10.1186/1752-4458-5-23

Forbes, D., Fletcher, S., Wolfgang, B., Varker, T., Creamer, M., Brymer, M.J., Ruzek, J.I., Watson, P., & Bryant, R.A. (2010). Practitioner perceptions of Skills for Psychological Recovery: A training programme for health practitioners in the aftermath of the Victorian bushfires. *Australian & New Zealand Journal of Psychiatry, 44*, 1105–1111. doi:10.3109/00048674.2010.513674

Forbes, D., Lewis, V., Varker, T., Phelps, A., O'Donnell, M., Wade, D.J., Ruzek, J.I., Watson, P., Bryant, R.A., & Creamer, M. (2011). Psychological First Aid following trauma: Implementation and evaluation framework for high-risk organizations. *Psychiatry, 74*, 224–239. doi:10.1521/psyc.2011.74.3.224

Furr, J. M., Comer, J. S., Edmunds, J. M., & Kendall, P. C. (2010). Disasters and youth. A meta-analytic examination of posttraumatic

stress. *Journal of Consulting and Clinical Psychology, 78*, 765–780. doi:10.1037/a0021482

Hinojosa J. & Meléndez E. (2018). The housing crisis in Puerto Rico and the impact of Hurricane Maria. Center for Puerto Rican Studies (RB2018-04). Retrieved from https://centropr.hunter.cuny.edu/sites /default/files/data_briefs/HousingPuertoRico.pdfhttps://centropr.hunter.cuny.edu/sites/default/files/data_briefs/HousingPuertoRico.pdf.

Hobfoll, S. E., Watson, P., Bell, C. C., Bryant, R. A., Brymer, M. J., Friedman, M. J., et al. (2007). Five essential elements of immediate and mid-term mass trauma intervention: Empirical evidence. *Psychiatry, 70*, 283–315. doi:10.1521/psyc.2007.70.4.283

International Federation of Red Cross and Red Crescent Societies (2018). World Disasters Report 2018. Retrieved from http://media.ifrc.org/ifrc/wp-content/uploads/sites/5/2018/10/B-WDR-2018-EN-LR.pdf

Institute of Medicine. (2015). *Healthy, resilient, and sustainable communities after disaster: Strategies, opportunities, and planning for recovery*. Washington, DC: The National Academies Press. doi:10.17226/18996

Israel, B. A., Schulz, A. J., Parker, E. A., Becker, A. B., Allen, A. J., & Guzman, R. (2003). Critical issues in developing and following community based participatory research principles. In M. Minkler & N. Wallerstein (Eds.), *Community based participatory research for health* (pp. 53–76). San Francisco: Jossey-Bass.

Israel, B. A., Eng, E., Schulz, A. J., & Parker, E. A. (2005). Introduction to methods in community-based participatory research for health. In B. A. Israel, E. Eng, A. J. Shulz, & E. A. Parker (Eds.), *Methods in community-based participatory research for health* (pp. 3–26). San Francisco: Jossey-Bass.

Jaycox, L. H., Tanielian, T. L., Sharma, P.,Morse, L., Clum, G., & Stein, B. D. (2007). Schools' mental health responses following Hurricanes Katrina and Rita. *Psychiatric Services, 58*, 1339–1343.

Jaycox, L. H., Cohen, J. A., Mannarino, A. P., Walker, D. W., Langley, A. K., Gegenheimer, K. L., Scott, M. & Schonlau, M. (2010). Children's mental health care following Hurricane Katrina: A field trial of trauma-focused psychotherapies. *Journal of Traumatic Stress, 23*, 223–231. doi:10.1002/jts.20518

Jaycox, L.H., Langley, A.K., & Hoover, S.A. (2018). *Cognitive Behavioral Intervention for Trauma in Schools (CBITS)*: Second Edition. Santa Monica, CA: RAND Corporation, 2018. https://www.rand.org/pubs/tools/TL272.html.

Kataoka, S., Stein, B. D., Jaycox, L. H., Wong, M., Escudero, P., Tu, W., Zaragoza, C., and Fink, A. (2003). A school-based mental health program for traumatized Latino immigrant children. *Journal of the American Academy of Child and Adolescent Psychiatry,42*, 311–318. doi:10.1097/00004583-200303000-00011

Kilmer, R. P., Gil-Rivas, V., & MacDonald, J. (2010). Implications of major disaster for educators, administrators, and school-based mental health professionals: Needs, actions, and the example of Mayfair Elementary. In R. P. Kilmer, V. Gil-Rivas, R. G. Tedeschi, & L. G. Calhoun (Eds.), *Helping families and communities recover from disaster: Lessons learned from Hurricane Katrina and its aftermath* (pp. 167–191). Washington, DC: American Psychological Association.

Kishore, N., Marqués, D., Mahmud, A., Kiang, M.V., Rodriguez, I., et al. (2018) Mortality in Puerto Rico after Hurricane Maria. *New England Journal of Medicine, 379*, 162-170. doi:10.1056/NEJMsa1803972

Kronenberg, M.E., Cross Hansel, T., Brennan, A.M., Osofsky, H.J., Osofsky, J.D., & Lawrason, B. (2010). Children of Katrina: Lessons learned about postdisaster symptoms and recovery patterns. *Child Development, 81*, 1241–1259. doi:10.1111/j.1467-8624.2010.014 65.x

La Greca, A. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology, 64*, 712–723. doi:10.1037/0022-006X.64.4.712

La Greca, A.M. & Silverman, W.K. (2009). Treatment and prevention of posttraumatic stress reactions in children and adolescents exposed to disaster and terrorism: What is the evidence? *Child Development Perspectives, 3*, 4–10. doi:10.1111/j.1750-8606.2008.00069.x

La Greca, A.M., Silverman, W.K., Lai, B.S., Jaccard, J.(2010) Hurricane-related exposure experiences and stressors, other life events, and social support: Concurrent and prospective impact on children's persistent posttraumatic stress symptoms. *Journal of Consulting and Clinical Psychology, 78*, 794–805. doi:10.1037/a0020775

La Greca, A. M., Lai, B. S., Llabre, M. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (2013). Children's postdisaster trajectories of PTS symptoms: Predicting chronic distress. *Child & Youth Care Forum, 42*, 351–369. doi:10.1007/s10566-013-9206-1

Lai, B.S., La Greca, A.M., Auslander, B.A., Short, M.B. (2013). Children's symptoms of posttraumatic stress and depression after a natural disaster: Comorbidity and risk factors. *Journal of Affective Disord-ers, 146*, 71–78. doi:10.1016/j.jad.2012.08.041

Lai, B. S., Auslander, B. A., Fitzpatrick, S. L., & Podkowirow, V. (2014). Disasters and depressive symptoms in children: A review. *Child & Youth Care Forum, 43*, 489-504. doi:10.1007/s10566-014-9249-y

Langley, A., Gonzalez, A., Sugar, C., Solis, D. and Jaycox, L. H. (2015). Effectiveness of an elementary school-based intervention for multicultural children exposed to traumatic events. *Journal of Consulting and Clinical Psychology, 83*, 853–865. doi:10.1037/ ccp0000051

Lurie N., Manolio, T., Patterson, A.P., Collins, F., Frieden, T. (2013). Research as a part of public health emergency response. *New England Journal of Medicine, 368*, 1251–1255. doi:10.1056/NEJMs b1209510

McLaughlin, K. A., Koenen, K. C., Hill, E. D., Petukhova, M., Sampson, N. A., Zalavsky, A. M., & Kessler, R. C. (2013). Trauma exposure and posttraumtic stress disorder in a national sample of adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 52*, 815–830. doi:10.1016/j.jaac.2013.05.011

National Child Traumatic Stress Network. (2005). The NCTSN Child and Adolescent Assessment and Referral Tool. Retrieved at www.nc tsn.org.

Norris, F. H., Friedman, M. J., Watson, P. J., & Byrne, C. M. (2002b). 60,000 disaster victims speak: Part 1. An empirical review of the empirical literature, 1981–2001. *Psychiatry, 65*, 207–239. doi:10.1521/psyc.65.3.207.20173.

Orengo-Aguayo, R., Stewart, R., de Arellano, M., Suárez-Kindy, J., & Young, J. (2019). Disaster exposure and mental health among Puerto Rican youth after hurricane Maria. JAMA Network Open, 2(4):e192619. DOI:10.1001/jamanetworkopen.2019.2619.

Orengo-Aguayo, R., Stewart, R.W., Martínez-González, K.G., Suárez-Kindy, J.L., Christian-Herrero, M.C., & Rivera-Colón, I. (2019). Building collaborative partnerships across professions to implement trauma-focused cognitive behavioral interventions after hurricane Maria in Puerto Rico. *The Behavior Therapist, 42*, 123–126.

Pasch, R.J., Penny, A.B., & Berg, R. (2018). *Hurricane Maria*. National Oceanic and Atmospheric Administration Report (AL 152017). Retrieved from https://www.nhc.noaa.gov/data/tcr/AL152017_ Maria.pdf

Perilla, J. L., Norris, F. H., & Lavizzo, E. A. (2002). Ethnicity, culture, and disaster response: Identifying and explaining ethnic differences in PTSD six months after Hurricane Andrew. *Journal of Social & Clinical Psychology, 21*, 20–45. doi:10.1521/jscp/21.1.20.22404

Pina, A.A., Villata, I.K., Ortiz, C.D., Gottschall, A.C., Costa, N.M., & Weems, C.F. (2008). Social support, discrimination, and coping as predictors of Posttraumatic stress reactions in youth survivors of

hurricane Katrina. *Journal of Child & Adolescent Psychiatry, 37*, 564–574. doi:10.1080/15374410802148228

Pynoos, R. S., Goenjian, A. K., & Steinberg, A. M. (1998). A public mental health approach to the postdisaster treatment of children and adolescents. *Child & Adolescent Psychiatric Clinics of North America, 7,* 195–210. doi:10.1016/S1056-4993(18)30268-2

Russoniello, C. V., Skalko, T. K., O'Brien, K., McGhee, S. A., Bingham-Alexander, D., & Beatley, J. (2002). Childhood posttraumatic stress disorder and efforts to cope after Hurricane Floyd. *Behavioral Medicine, 28*, 61–70. doi:10.1080/08964280209596399

Scott, B. G., Lapré, G. E., Marsee, M. A., & Weems, C. F. (2014). Aggressive behavior and its associations with posttraumatic stress and academic achievement following a natural disaster. *Journal of Clinical Child & Adolescent Psychology, 43*, 43–50. doi:10.1080/15374416.2013.807733

Seballos, T., Tanner, M., Tarazona, & Gallegos, J. (2011). Children and disasters: Understanding impact and enabling agency. Children in a Changing Climate. Retrieved from https://www.uncclearn.org/sites/default/files/inventory/unicef09.pdf

Silverman, W. K., & La Greca, A. M. (2002). Children experiencing disasters: Definitions, reactions, and predictors of outcomes. In A. M. La Greca, W. K. Silverman, E. M. Vernberg, & M. C. Roberts (eds.), *Helping Children Cope with Disasters and Terrorism* (pp. 11–33). Washington, DC, US: American Psychological Association.

Stein, B. D., Jaycox, L. H., Kataoka, S. H., Wong, M., Tu, W., Elliot, M. N., and Fink, A. (2003). A mental health intervention for school children exposed to violence: A randomized controlled trial. *JAMA, 290*, 603–611. doi:10.1001/jama.290.5.603

Steinberg, A. M., Brymer, M. J., Steinberg J. R., & Pfefferbaum, B. (2006). Conducting research on children and adolescents after mass trauma. In F. Norris, M. Friedman, S. Galea, & P. Watson (Eds.), *Methods for Disaster Mental Health Research* (pp. 243–253). New York: Guildford Press.

Stewart, R., Orengo-Aguayo, R., Cohen, J.A., Mannarino, A.P., & de Arellano, M.A. (2017). A pilot study of Trauma-Focused Cognitive Behavioral Therapy delivered via telehealth technology. *Child Maltreatment, 22*, 324–333. doi:10.1177/1077559517725403

Tang, B., Liu, X., Liu, Y., Xue, C., & Zhang, L. (2014). A meta-analysis of risk factors for depression among adults and children after natural disasters. BMC Public Health, 14, 623–635. doi:10.1186/1471-2458 - 14-623

Vernberg, E.M., Steinberg, A.M., Jacobs, A.K., Brymer, M.J., Watson, P.J., Osofsky, J.D., Layne, C.M., Pynoos, R.S., & Ruzek, J.I. (2008). Innovations in disaster mental health: Psychological First Aid. *Professional Psychology: Research and Practice, 39*, 381–388. doi: 10.1037/a0012663

Wang, C. W., Chan, C. L., & Ho, R. T. (2013). Prevalence and trajectory of psychopathology among child and adolescent survivors of disasters: A systematic review of epidemiological studies across 1987–2011. *Social Psychiatry and Psychiatric Epidemiology, 48*, 1697–1720. doi:10.1007.s00127-013-0731-x

Weems, C. F., Scott, B. G., Taylor, L. K., Cannon, M. F., Romano, D. M., & Perry, A. M. (2013). A theoretical model of continuity anxiety and links to academic achievement in disaster-exposed school children. *Development and Psychopathology, 25*, 729–737. doi:10.1017/S09 54579413000138

Weems, C. F., Taylor, L. K., Cannon, M. F., Marino, R. C., Romano, D. M., Scott, B. G., … & Triplett, V. (2010). Post traumatic stress, context, and the lingering effects of the Hurricane Katrina disaster among ethnic minority youth. *Journal of Abnormal Child Psychology, 38*, 49–56. doi:10.1007/s10802-009-9352-y