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Coping with natural disasters in Yogyakarta, Indonesia: The psychological state of elementary school children as assessed by their teachers

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Abstract

The nation of Indonesia is in an area of geological instability, resulting in repeated and severe natural disasters. As a result, Indonesian residents are likely to be exposed repeatedly to significant traumatic events. Researchers and clinicians working in such areas face the challenge of assessing large groups of people exposed to trauma and identifying culturally-specific as well as culturally-invariant symptoms of distress. The current study addressed these issues by using teachers as a point of contact for working with affected children. Elementary school teachers from 16 schools affected by a major earthquake in Central Java, Indonesia in 2006 reported on the continuing symptoms

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exhibited by their students approximately two years later. Teachers identified—in their own words—behavioral problems that children had developed following the earthquake. On average, 4.5% (SD = 5.0%) of children were identified as exhibiting problematic behavior two years after the earthquake (individual school rates ranged from 0.5% to 17.12%), with negative school-based behaviors (e.g. lack of academic motivation) reported as the most common symptom. Other symptoms were consistent with Western-identified posttraumatic stress, and two culturally-specific symptoms were identified. Teachers can serve as an effective first-line resource for assessing the psychological state of children exposed to natural disasters.

Keywords

earthquake, Indonesia, natural disasters, posttraumatic stress

The nation of Indonesia, as well as other countries located in the area, is situated in a geologically unstable area called the Pacific Ring of Fire. Since 2000, Indonesia has experienced over 30 major earthquakes, almost 50 floods and landslides, seven volcanic eruptions, and at least one disastrous tsunami (Asian Disaster Reduction Center, 2010). In May, 2006, Central Java, Indonesia suffered a devastating 6.3 magnitude earthquake. The earthquake wreaked havoc to the surrounding community, resulting in 5,778 deaths, 37,883 serious injuries, and the complete destruction of 139,859 homes (Asian Disaster Reduction Center, 2007). Emergency first-aid responders in these situations face the task of how to identify the means by which distress is expressed in Central Java culture as well as how to screen and treat a large population for physical and mental health problems (Schonfeld & Gurwitsch, 2009). The current study examined the utility of working with local teachers as an initial point of contact for identifying and screening for distress among children impacted by a disaster.

In the wake of disasters, children are among those at the highest risk for developing psychological trauma (Belfer, 2006; Norris et al., 2002). One particular form of distress that is prevalent among children in the aftermath of disasters is Posttraumatic Stress Disorder (PTSD; Schonfeld & Gurwitsch, 2009). However, traditional PTSD criteria (American Psychiatric Association, 2000) may underestimate the rates of PTSD due to developmental differences in expression of symptoms (Scheeringa, Zeanah, Myers, & Putnum, 2003). As a result, researchers and clinicians have begun to enumerate through research the various ways in which children's posttraumatic distress can manifest (Williams, Alexander, Bolsover, & Bakke, 2008). In their review of the literature on children's PTSD responses, Dyregrov and Yule (2006) identified typical distress symptoms, including overt aggression (e.g. destructiveness, physical aggression), as well as symptoms of withdrawal (e.g. decreased activity levels, sadness, isolation from friends and family). Moreover, akin to adult symptoms of PTSD, children may suffer

increased anxiety and fear of similar disasters arising from memories of their experiences. Unique to this developmental period, however, is the possibility that distressed children may exhibit decreased school performance (e.g. poor grades, inability to concentrate). Additionally, children may demonstrate regressive behaviors (e.g. acting like a younger child, or not being able to perform certain skills they previously mastered), and may complain of somatic symptoms (e.g. headaches, stomachaches; see Murray, 2006). Several studies have also noted that children who experienced a destructive tsunami displayed nonspecific symptoms of anxiety, separation anxiety from their parents, and decreased appetite, bedwetting, excessive crying, and nonspecific somatic symptoms (Klingman, 1995; Math et al., 2006; Vijayakumar, Kannan, & Daniel, 2006; Winston, Kassam-Adams, Garcia-Espana, Ittenbach, & Cnaan, 2003). Thus, children's symptoms of distress following a traumatic event may be expressed in multiple ways. Nonetheless, most research has focused on distress in the immediate aftermath of a disaster, and only a few studies (e.g. Vijayakumar et al., 2006; Yule et al., 2000) have examined the long-term signs of distress among children several years after a disaster.

Large-scale screening for children's mental health problems in the aftermath of disasters is a challenging task. Emergency health care providers, who are often the first to interact with children, report feeling unprepared to identify and/or respond to children's mental health needs (Hu, Adams, Boscarino, & Laraque, 2006; Madrid, Grant, Reilly, & Redlener, 2006). Often, they focus on physical problems and fail to diagnose mental health concerns. In screening for children's problems, emergency responders have sometimes utilized parents as reporters of their children's symptoms; however, parents often only report physical, somatic symptoms (Gurwitsch et al., 2004). Alternatively, clinicians have sometimes conducted structured interviews to help identify mental health problems in children (Gurwitsch et al., 2004). Nonetheless, in attempting to screen large populations in the aftermath of disasters, it is not always feasible to perform clinical interviews or speak with parents on a case-by-case basis. A more systematic, efficient screening tool is needed that has the sensitivity to identify post-disaster mental health problems in children.

In an international context, the situation becomes even more difficult. A common concern regarding the use in international settings of mental health instruments and constructs developed in a Western context is whether these assessments are cross-culturally equivalent (Sue & Chang, 2003). Additionally, an underlying concern is whether the content of assessments properly represents the potential symptomatology of a construct within a particular population (Belfer, 2006; Bolton & Tang, 2004; Sue & Chang, 2003). While noting a few minor variations, research has demonstrated that there is an underlying universality to some imported constructs (Leung & Wong, 2003). However, others caution that without working with the population to understand how individuals in the community may display symptoms of distress, direct importation of measures can lead to serious mistakes about the prevalence and structure of mental health issues that are

expressed in other ways. Thus, some researchers have advocated for a process of cultural adaptation of measures: a process by which the assumptions that mental health issues are expressed in certain specific symptoms are directly tested, and modifications to symptom assessments are made to make sure that local symptoms are included (Bolton & Tang, 2004). These cultural adaptation processes may vary in their specific structure, but the overall goal is to assess in a bottom-up fashion what the local symptoms of distress are, to compare these symptoms to existing measures or assumptions about how distress is expressed, and to modify assessment tools to make sure that any locally-specific symptoms are included in the assessment. When examining posttraumatic distress specifically, this is particularly important as there is strong evidence that culture affects how posttraumatic distress is conceptualized and expressed (Osterman & de Jong, 2007).

In trying to assess the level of distress among children and the way that it is expressed in non-Western cultures, teachers could be an efficient community resource. In general, adults can serve as reliable reporters of children's behaviors (Cole & Brown, 2002; Loeber, Green, & Lahey, 1990; Loeber, Green, Lahey, & Stouthamer-Loeber, 1991). Second only to parents, teachers spend a great deal of time with school-age children and represent a potentially reliable source of information regarding their physical and mental health. Indeed, clinicians and researchers tend to perceive teachers as more reliable reporters of school-age children's hyperactivity and inattentiveness than mothers and the children themselves (although mothers and children are perceived as more reliable than teachers in their reports of children's internalizing behaviors, see Loeber et al., 1990). In fact, in a longitudinal study of children's disruptive behaviors and long-term outcomes (e.g. school achievement, mental health problems), Verhulst, Koot and Van der Ende (1994) noted that teachers' reports were more accurate and predictive of children's later adjustment than mothers' reports. Similarly, Loeber and colleagues (1991) demonstrated the effectiveness of teacher reports of school-age children's externalizing behaviors in predicting later maladjustment.

Recognizing the potential utility of teachers and the need for large-scale delivery systems for physical and mental health assistance, first-aid responders have started to partner with schools. Working with school staff provides important insights into the context of trauma for that particular community (Heath, Nickerson, Annandale, Kemple, & Dean, 2009). School staff can also provide vital information regarding children's needs and well-being. Additionally, the school represents a setting that is structured and supportive. However, there is a need for an expanded empirical research base that demonstrates the efficacy of teachers in assessing child posttraumatic distress as well as identifying locally-specific distress symptoms. The current project was designed as a brief assessment of elementary school children's behavioral problems two years after a major earthquake in their community, using teachers as primary informants. We had three primary goals for the teacher-based assessment. The first was to identify the base rates and structure of post-earthquake distress in an Indonesian elementary school sample.

The second goal was to assess the utility of teachers as a large-scale assessment tool to identify children experiencing post-disaster distress. Our final goal was to examine whether teachers, as residents of the target culture, could identify local, culturally-specific symptoms of distress in children as an initial step in the cultural adaptation process.

Methods

Local context

This research was conducted in Central Java, Indonesia, two years after the major earthquake that struck the region in 2006. The region is primarily rural and agricultural. Demographic information that we collected from a sample of parents from this region indicated that 40% of the population had a junior high school level education or less, and 60% had an annual income of less than USD \$900. The majority of the population is ethnic Javanese. Culturally, this area values restraint in emotional expression and behavior. Residents emphasize interpersonal harmony, avoiding conflict, and uncomplaining acceptance of any negative events (Magnis-Suseno, 2001).

The Indonesian school system is structured in several distinct stages, including pre-school, primary school (six years), junior high school (three years), high school (three years), and higher education. However, education is mandated for only nine years (primary and junior high school). There are three major school systems: public schools, which are supported by state funds and students attend for free, and Islamic and Catholic schools, which are managed by religious groups and require students to pay tuition. Most teachers in the primary schools have completed at least 12 years education (primary through high school), plus two years of higher education. Teachers meet with students at school for four to five hours each day. Classroom size varies from seven to 15 students (in smaller schools) to 30–40 students (in larger schools). National educational requirements call for the teaching of the national language (*Bahasa Indonesia*); however, in rural areas, such as the site of this study, schools also teach the local dialect (*Basa Jawa*).

Design

We conducted a brief assessment of child behavioral problems two years after the 2006 Central Java earthquake, using teachers as primary informants. Researchers from Sanata Dharma University contacted elementary school principals about the project, explaining that they were interested in collecting data on children still showing behavior problems two years after the earthquake. Researchers gave questionnaires to principals and principals distributed the questionnaires to their home-room teachers. The questionnaires were collected by the research team two to three weeks later.

Sample

Thirty-seven elementary schools in the educational subdistricts of Bambanglipuro and Pundong in Bantul, Special District of Yogyakarta, Indonesia (the subdistricts most strongly affected by the 2006 earthquake) were invited to participate in this research. Sixteen schools (43.2%) provided data. One hundred and forty-seven home room teachers in the 16 schools returned the questionnaires, representing a total of 3,115 children in the 1st through 6th grades, ages 6- to 14-years-old.

Measures

Teachers were asked to complete an open-ended qualitative questionnaire about the students in their class. The questionnaire asked the teachers to identify whether children in their class displayed 'behavioral problems after the earthquake'. For each child who was identified as displaying such a problem, teachers were asked to describe the problem and to rate its frequency. Measures were developed and delivered in Indonesian. Results were recorded in Indonesian on a spreadsheet and later translated into English.

Analysis

Base rates for distress were calculated at the school and overall level by identifying how many students in each class were described as showing problems following the earthquake. Translated symptoms were coded by two English-speaking psychologists (doctoral level). These psychologists reviewed the descriptions of the children's problems identified by the teachers and coded the symptoms as either (a) consistent with existing (Western) literature on child posttraumatic stress (PTS) symptoms, based on DSM-IV descriptions of Posttraumatic Stress Disorder (PTSD, American Psychiatric Association, 2000); (b) consistent with existing (Western) literature on distress not related to PTS; or (c) not identified as a symptom of distress in existing (Western) research literature. Inter-rater reliability was $\rho = 0.79$.

Results

Incidence rates

Teachers uniquely identified 205 children (87 females, 118 males) among all the schools as demonstrating problematic behavior as a result of the earthquake in Central Java. On average, 4.5% (SD = 5.0%) of school children in this sample were identified as exhibiting problematic behavior(s). Individual school rates ranged from 0.5% to 17.1%, suggesting a wide variation in the continuing impact of the earthquake.

Symptoms

Within the population of identified children, teachers listed a total of 369 symptoms of possible distress. Of these, 85.1% of the symptoms were identified as indicative of symptoms consistent with those that children who may have PTS would display. An additional 5.7% corresponded to other typical Western symptoms of distress in children. The final 9.2% of symptoms appeared unique to Indonesian culture. Table 1 displays the list of symptoms that the teachers enumerated, grouped by theme. Table 1 also reports the percentage of students identified with distress who were described as displaying that specific symptom.

School-based symptoms were the most frequent form of post-earthquake distress reported by teachers. Specifically, teachers noticed decreases in student achievement, lack of motivation to study, absences, and the inability to concentrate and master school lessons. The second most frequently endorsed group of symptoms was a fear of the traumatic experience re-occurring or having intrusive thoughts of the earthquake. This group of symptoms included intrusive thoughts

Table 1. Percentage of students ($n = 205$) identified by their teachers as experiencing a particular posttraumatic distress symptom

Symptom	Percentage of students
<i>Posttraumatic stress (PTS) symptoms</i>	
School problems	40.5%
Fear	37.6%
Emotional problems	20.5%
Externalizing behaviors	18.0%
Withdrawal	16.6%
Clinging to adults	6.8%
Somatic problems	6.3%
Hyperactivity	5.4%
Regressive behavior	2.9%
Forgetful	1.0%
Dazed	1.0%
Sleep problems	1.0%
<i>Non-PTS Western symptoms</i>	
Decreased self-esteem	2.9%
<i>Culture-specific symptoms</i>	
Daydreaming	9.8%
Blank stare (<i>ndomblong</i>)	4.9%

Note. Because students could be coded as exhibiting more than one symptom, the total sums to greater than 100%.

and increased physiological or psychological arousal to situations that reminded students of the original earthquake (e.g. loud noises, thunder). Third, a substantial portion of students were reported to exhibit emotional problems. These children displayed an inability to control their emotions, a greater frequency of negative emotions (e.g. anger, sadness), or would easily display distress (e.g. crying). Children would also engage in more frequent rates of externalizing behaviors (e.g. arguing, fighting, hitting). Nearly 17% of students were reported to display symptoms of withdrawal. This withdrawal was typified by reduced activity levels, isolation from others, and lack of communication with others. Students also demonstrated clingy behaviors with adults (e.g. insisting on the presence of their parents or teachers or that the teachers remain next to them as they completed school assignments). Approximately 6% of children were reported to display somatic symptoms that may be indicative of distress, such as complaints of stomachaches, increased heart rate, and reduced appetite. Teachers would also note some students were more hyperactive after the earthquake, describing them as having difficulty keeping still, running around, or just being too active. A small percentage of students (3%) were reported to have exhibited regressive behaviors (e.g. needing to be hand-fed, loss of bladder control). The final three distress symptoms identified included students being abnormally forgetful, more dazed, or having sleep problems.

Teachers additionally endorsed one other symptom—decreased self-esteem—that is recognized by Western psychology, but not necessarily associated with PTS among children. It was noted for approximately 3% of students.

Teachers also identified two apparently unique, culturally-specific symptoms of children's PTS that to our knowledge have not previously been described in Western psychology. Specifically, teachers reported that almost 10% of children would engage in excessive daydreaming during school time. A second symptom, having a blank stare (*ndomblong*), was described as a student who would be physically present, but would appear mentally not present (i.e. mentally detached).

Discussion

This study was designed to provide information about the rates of post-earthquake distress in elementary school children in Central Java as a part of a larger project designed to provide psychological services to parents and children in need. We were able to identify about 5% (on average) of elementary school students who were still exhibiting behavioral signs of distress two years after a major earthquake in their community. However, we found widely diverse rates of psychological distress, with incidence rates ranging from 0.5% to slightly more than 17% across schools. This widely varying rate may suggest different patterns of exposure to earthquake-related traumas, with some areas perhaps more strongly affected than others. However, there may be other individual or community-specific factors that exacerbated distress in some schools or mitigated distress in others. Future research should examine in more detail the extent to which structural or

demographic factors of the families, neighborhoods, or schools were responsible for the differing patterns of symptomatology reported in the schoolchildren.

We also demonstrated the utility of using teachers in a quick and large-scale assessment of rates of distress following major disasters. Teachers were effective in identifying a wide variety of symptoms of posttraumatic distress in the children in their classrooms. The majority of the symptoms identified coincide with typical responses of distress in children (Dyregrov & Yule, 2006). Indeed, over 85% of the symptoms that teachers identified as behavioral problems that the children had developed since the earthquake were directly in line with what existing research identifies as symptoms of posttraumatic distress. Major symptoms of PTSD and general PTS in children—including excessive fear, age regression, hyperactivity, emotional problems, clinging behavior, and withdrawal—were all identified by the teachers. The close correspondence between symptoms of PTSD identified in the research literature and those behavioral problems identified by teachers suggests that in this study, teachers are an effective first-line resource for assessing distress in their students. By focusing on teachers, a survey requiring contact with only 16 schools was able to provide a broad assessment of more than 3,000 individual children. This greatly reduces the organizational resources required and suggests that a survey of teachers may be a means to examine a large number of affected youth in the aftermath of a natural disaster rapidly and effectively.

We also demonstrated that teachers can be a useful source of information about culturally-specific forms of distress in children. Because culture strongly affects how post-disaster distress is experienced and expressed (Osterman & de Jong, 2007), it is inappropriate for researchers or clinicians to rely too heavily on psychological constructs developed or validated in locales other than the area of work. An open-ended qualitative assessment such as was used in this investigation can be an effective initial tool for assessing culturally-specific forms of distress (Bolton & Tang, 2004). Teachers in this study regularly identified behavioral problems not previously described in the existing post-disaster research literature. Specifically, many children in this sample were reported to engage in excessive daydreaming. A second symptom (*ndomblong*) was also regularly reported; this symptom is not directly translatable into English, but may be described as exhibiting a blank stare. It is possible that both of these symptoms, and particularly *ndomblong*, are culturally-specific forms of dissociation, which has been found in some studies to be associated with PTSD in Western populations (e.g. Briere, Scott, & Weathers, 2005; Murray, Ehlers, & Mayou, 2002), although we cannot confirm this association with our data. Nonetheless, it may be very fruitful for future research in Indonesia to focus specifically on *ndomblong* and dissociation and the role they may play in PTSD expression in this culture. Indeed, Lanius and colleagues (2010) have recently argued that there may be a specific dissociative subtype of PTSD, particularly exhibited among children after repeated or chronic exposure to trauma (see also Terr, 1991). Overall, while our effort cannot be considered a full cultural adaptation process, our teacher survey provided information suggesting that the majority of symptoms of distress exhibited by children in Indonesia are consistent

with children in other parts of the world, although some symptoms may be culturally specific.

We acknowledge two limitations of our approach. First, the symptoms identified in this study make it clear that teachers are focused on symptoms that are most relevant to the classroom experience. Slightly more than 40% of the symptoms identified were related directly to school performance. Other symptoms frequently reported were those that involved overt or disruptive expressions of distress, including excessive fear (37.6% of students with distress showing this) or emotional control problems (20.5%). As symptoms become less overt and disruptive, teachers reported them less, with problems such as regression in age-appropriate behavior and forgetfulness or dazed behavior being reported rarely (identified by teachers at 2.9%, 1%, and 1%), even though research identifies them as regular symptoms of PTS in children. Sleep disorders, removed entirely from the school setting, were reported in only 1% of the students who showed behavioral problems. This suggests that (understandably) teachers are most attuned to behavioral problems related to the context in which they interact with the children. This is consistent with previous research demonstrating that teachers are more attuned to school-relevant problems (Loeber et al., 1991) and means that surveys of teachers cannot be considered an extremely accurate individual-level diagnostic tool for all forms of posttraumatic distress. It is highly probable that teachers will miss behavioral problems that are expressed primarily in non-disruptive ways. As a result, teachers may under-report levels of distress or miss children who are upset but not expressing it overtly. Thus, while teachers are a valuable initial point of contact and a helpful tool in comparing differing rates of distress across a large community or across people from similar socio-cultural backgrounds (where, it can be expected, there will not be systematic differences in the ways in which distress is expressed), teacher-level surveys cannot be considered sufficient for a truly diagnostic survey. Nonetheless, teachers may be able to provide a rough estimate of problem rates, which is a critical first step in assessing the impact of large-scale disasters and a necessary precursor to more targeted and in-depth work in a disaster-affected area.

The second limitation of our study is that a majority (56.8%) of schools initially contacted did not return requested information. Schools may not have done so for many reasons—in the aftermath of a disaster, the teachers and principals are busy and may be unable to complete questionnaires. Moreover, most schools that gave a reason for not participating said that they did not do so because their children did not have problems. It is unlikely that this is the case and demonstrates that schools may be affected by pressures such as a dismissive attitude toward mental health issues, political considerations around admitting behavioral problems in the school, or a disconnect between student behavior and administration awareness. Unless these pressures are countered by a systematic approach to encouraging participation, school surveys may not be as comprehensive as their potential indicates. However, as with all survey research, it is likely that these pressures can be overcome or reduced by strategies such as

formal partnership with the school system hierarchy, repeated contacts to encourage return of surveys, or explanations of why returned information is important.

Implications for those Working with Children in Schools

This survey of elementary schools set out to assess child distress in Central Java two years after a major earthquake. With a relatively small organizational structure, data on 3,115 students were collected from 147 teachers. These data provide key information about the incidence and structure of post-earthquake distress in students in Java. Although there are caveats about the comprehensiveness of the symptoms reported and the willingness of all schools to participate in the project, overall this survey demonstrates that teachers are attuned to symptoms of post-traumatic distress in their students and are a useful initial point of contact in a post-disaster situation for a large-scale assessment of child distress.

This research has direct implications for those working within the schools, particularly school psychologists, as well as those partnering with them. We demonstrated that teachers can effectively identify and screen for child distress. These reports were made by teachers with no prior training in recognizing PTS symptoms, suggesting that capacity can likely be significantly enhanced if the teachers are provided with basic information about PTS symptomatology. This could assist teachers in distinguishing typical from more severe reactions in their students and may enable them to serve as a source of referrals for additional support.

This study also provides support for the utility of psychological programs that integrate existing classroom activities into the assessment (and possibly service delivery) of psychological needs. Current US government-supported recommendations for post-disaster response emphasize the value of working within existing social structures when possible (Brymer et al., 2006), and the American Academy of Child and Adolescent Psychiatry specifically recommends that screenings be conducted through the schools following large-scale traumas (Cohen et al., 2010). Our research provides empirical evidence for these recommendations by demonstrating that for the assessment of child PTS, teachers and existing school systems are an effective initial assessment tool.

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