Psychological Effects of Mbagala Bombs Blasts in Children

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Abstract*: Uncontrolled explosions on 29th April 2009, at the Tanzania People's Defence Forces (TPDF) armouries in Mbagala military facility, a main storage area for various armaments in Dar es Salaam -Tanzania, tore through the walls and roofs, and landed on the floors of people's residences situated within a wide radius from the source of the blasts. The bomb blasts claimed the lives of 26 people (including 6 military soldiers), injuring about 600 and more than 8300 houses damaged and thousands of residents displaced. Adverse mental health effects in response to a variety of distressing events in Tanzania are well documented. Yet, there is a paucity of studies that have systematically assessed the phenomenon of psychological effects, and the Mbagala bomb blasts avails such a unique opportunity for such a study in a developing country's context. The purpose of this study was to investigate the psychological effects among the children involved in the Mbagala bomb blasts. It was hypothesized that the studied children would exhibit psychological disorders resulting from bomb blasts. The sample consisted of 211 randomly sampled primary school children. Psychological disorders were diagnosed using a scale called Brief Symptom Inventory-BSI in- children bomb survivors. The data were analysed with the help of SPSS software, and presented statistically. The study findings showed that 60.3% of children bomb survivors had psychological disorders associated with bomb blasts. However, personal meaning of the event for the child, previous experience of trauma and appraisal of threat to life were related to the development of psychological disorders. Thus, the Mbagala bomb blasts affected the psychological life of children in the area. The study recommends provision of psychological treatment which may both improve general functioning of children in the post-trauma world and may act as a preventive measure, protecting children against future psychopathology.*

Key words: disorder, psychological, trauma, stress

INTRODUCTION

Tanzania, like other African countries, has been prone to both natural and man-made hazards, including droughts and agricultural pests, floods, accidents and earthquakes. According to Kimaro (2009), the country has experienced a number of calamities, thus, the widespread drought of 2005-06, the Northern Tanzania floods in 2006-07, followed by the outbreak of Rift Valley Fever in February 2007, floods in Lushoto-Tanga in 2002/03, in Mbeya 2008, also in Kilimanjaro in 2006/07.

There has also been the most frustrating trend of albino killings in the lake zone area in recent years (Lake Victoria). Albinos are killed or injured because their

organs (particularly genitals, limbs, breasts, fingers and the tongue), are reported to have high demand by the people involved in mining and fishing activities around Lake Victoria, especially Mwanza, Shinyanga and Mara regions (Ubwani, 2008). The belief that albinos have magical power is widespread in superstition and witchcraft beliefs, which tempts some politicians and business people to apply it in order to increase their prospects for success (Ubwani, 2008). These are all reminders of disaster potentials in Tanzania.

However, the event that stimulated this study was the uncontrollable blasts of military bombs stockpiled at the Tanzania People's Defence Forces (TPDF) armoury in Mbagala (some 14 kilometres from Dar es Salaam city centre) on 29th April 2009. The tragedy killed 26 people, injuring about 600 others and destroying about 8,300 homes (286 houses completely destroyed) and other properties (Joseph, 2009; Machira, 2009). In fact, this was a serious traumatic event among children who were around the study area.

Traumatic events in the world are as old as the history of man. In the DSM-III: American Psychological Association-APA (1980), a traumatic event was described as a catastrophic stressor that was outside the range of usual human experience. Most notably, the definition of what constitutes a traumatic event was altered to include events not outside the range of usual human experience, such as automobile accidents. The Diagnostic and Statistical Manual of Mental Disorders (IV) defines a traumatic event as an 'event that involves actual or threatened death or serious injury, or other threat to one's physical integrity' (APA, 1994). The traumatic event shatters survivors' basic assumptions about the world being a safe place, their known self-image and the values on which they based their lives (Janoff-Bulman, 1992), disrupting the normal life of the survivors and rupturing their connection with the surrounding normal environment.

However, there are different factors that influence responses to traumatic events. The major factors that influence responses to sudden, uncontrollable, and negative experiences include biological factors (i.e. resiliency), the severity of the event, social context (i.e. supportive environment), and previous and subsequent life events (van der Kolk, 1987). According to van der Kolk, these factors influence trauma responses because they affect the perception of uncontrollability and the degree to which an event is viewed negative.

PSYCHOLOGICAL EFFECTS OF TRAUMA IN CHILDREN

Although disasters share common elements, they are not alike. Each presents its own unique experiences, challenges, and consequences. Janoff-Bulman (1992) contends that people's world assumptions are composed of three elements: **self-worth** (the belief that they are good, decent, competent people), **world benevolence** (the belief that the world is a good place), and **world meaningfulness** (the belief that the distribution of good and bad outcomes makes sense). These assumptions are fundamental to people's beliefs about how the world does and should work. Following the experience of a traumatic event, an individual may suffer psychologically as a result of interruptions or alterations to these fundamental assumptions.

The psychological effects of trauma have been described throughout military history. Da Costa syndrome ("soldier's heart"), which is characterized by cardiac symptoms associated with irritability and increased arousal, was described in veterans of the American Civil War. During World War I (1914-1918), it was hypothesized that "shell shock" resulted from brain trauma caused by exploding shells. During World War II (1939-1945), terms such as "combat neurosis" and "operational fatigue" were used to describe combat-related symptoms (http://campus.houghton.edu/orgs/psychology/ptsd/history.htm).

Psychologists and other scientists have studied how children have been affected by traumatic events, such as the Oklahoma City bombing, and natural disasters, like hurricanes and floods. They found that anxiety and fear that many people experience after a traumatic event can be especially strong for children. The responses to trauma may be strong even for children who have been exposed to the event but were not direct victims, for example, if a child's loved one was injured in a disaster or his or her school was damaged (Anderson, 2005).

Children often display their symptoms through play, drawings and/or stories, or may exhibit fears not directly related to the event (e.g. fears of monsters) and separation anxiety (Perrin, *et al.,* 2000). They also display disruptive behaviours such as impulsivity and inattentiveness, which frequently negatively affect their academic achievement. Additionally, they may isolate themselves from others and withdraw from their peers. They may also demonstrate regressive behaviours such as enuresis, encopresis and thumb-sucking (Armsworth and Holaday, 1993).

Hamblen (2005) also points out a number of psychiatric disorders that are also commonly found in children who have been traumatized. These disorders include: depression, substance abuse; other anxiety disorders such as separation anxiety, panic disorder; and generalized anxiety disorder; and externalizing disorders such as attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder.

A lot of research on psychological consequences of disasters has documented the extent to which adult victims experience post-disaster reactions (Acierno *et al*., 2007; Galea *et al*, 2002, 2003; Kessler *et al*., 2006; Vlahov *et al*., 2002, 2004 as cited in Pellegrin, 2009). It has shown that adult disaster victims often report increased Post Traumatic Stress Disorder (PTSD), anxiety, and depressive symptoms as well as increased substance use. By comparison, research focusing on assessing child post-disaster reactions is relatively limited with only a small percentage of studies on the effects of disasters to children being conducted (Pellegrin, 2009).

In Tanzania, a study conducted by Messo (2010) which explored the prevalence of PTSD among the children victims of Mbagala bombs blasts showed that 92.8% of the participants exhibited PTSD symptoms. Nevertheless, the nature and extent of other psychological problems than PTSD resulting from that event were yet established. Clearly, Mbagala bomb blasts must have been a terrible experience, with psychological consequences, particularly in children.

METHODS

The principal design of this study was cross-section survey. The design has the advantage of providing information in a short period of time. This study was conducted at Mbagala Kuu area (Temeke District) where Tanzania Peoples Defence Force (TPDF); a military base which experienced bomb blasts on 29th April 2009 is located. It was most likely to have elements of the target population at Mbagala Kuu and Maendeleo primary schools because the two schools are close to the military base.

Stratified random sampling was used to separate boys from girls. Then, simple random sampling was used to get participants from both groups (boys and girls). Children were made to count numbers whereby every 5th number was picked to be included in the sample. The use of random sampling technique was meant to make the sample more close to represent the population. The study therefore involved 211 participants (113 boys and 98 girls). A sample of older school-age children (standard seven) was targeted to increase the likelihood that cognitive development, language and the ability to remember were adequate to respond to the research questions.

Instrument

The study employed a measure of psychological symptoms, called Brief Symptom Inventory-BSI (adopted from Derogatis and Spencer, 1982), which was modified by the researcher to fit in this current study. It was translated into Kiswahili (National Language of Tanzania) so as to be well understood by the children. The scoring system remained the same: 0 = not at all, 1 = a little bit, 2 = moderate, 3 = quite a bit and 4 = extremely

The Brief Symptom Inventory is a 53-item self-report symptom inventory designed to represent the psychological symptoms of psychiatric and medical patients, as well as community non-patient populations. It has nine symptom dimensions which are: somatisation: items 2, 7, 23, 29, 30, 33, and 37; obsessive-compulsive (concentration problems): items 5, 15, 26, 27, 32, and 36; interpersonal sensitivity (interpersonal relationship problems): items 20, 21, 22, and 42; depression: items 9, 16, 17, 18, 35, and 50; anxiety: items 1, 12, 19, 38, 45, and 49; hostility (anger): items 6, 13, 40, 41, and 46; phobic anxiety (fear): items 8, 28, 31, 43, and 47; paranoid ideation (suspiciousness): items 4, 10, 24, 48, and 51; and psychoticism (alienation): 3, 14, 34, 44, and 53. Items 11, 25, 39, and 53 do not factor into any of the dimensions, but are included in the scale because they are clinically important; therefore they were not considered in this study.

Analysis

This study was quantitative in nature; thus, data from questionnaires were explored and carefully inspected. The first step involved correct scoring of scale items using a prepared marking scheme that was prepared by the researcher. Then, data were analysed using the Statistical Package for Social Sciences (SPSS version 15). The analysis involved computations of the frequencies and percentages to get the general trend of the scores of each item. Also, frequencies of independent variable

(life stressors) were run to identify the traumatic events that were experienced by most participants.

In diagnosing the prevalence of psychological disorders, the total scores for BIS scale were subjected to binned analysis to get the exact number of participants who showed psychological disorders and those who did not show the disorder. Binned analysis was also used to get the scores of the participants from each of the nine dimensions of psychological disorders.

Results

Background information about children (age, sex, economic status of their parent/s or guardians and family size) was sought. Frequencies and percentages were used to present participants' demographic and socio-economic characteristics.

Table 1: Demographic and Socio-Economic Characteristics of Participants

Variable	Characteristic	Boys	Girls	Total
Parents	Parents	44%	48%	92%
	Guardians	4.9%	3.1%	8%
	Total			**100%**
Parents'/guardians' occupation	Government employee	17.3%	17.9%	35.2%
	Private sector employee	14.8%	15.3%	30.1%
	Business	19.5%	13.5%	33%
	Others	0.9%	0.8%	1.7%
	Total			**100%**
Family size	Less than 7	40.3%	42%	82.3%
	Higher than 7	13.1%	4.6%	17.7%
	Total			**100%**
Age	Below 12 years	4.6%	20.4%	25%
	13 years and above	49.9%	25.1%	75%
	Total			**100%**

The study involved participants with ages ranging from 11 to 15 years old (the mean age 13.14 years). A majority of participants (92%) lived with their parents. The remaining number of participants lived with their guardians. These findings are supported by the United Nations Children's Fund [UNICEF] (2005) which estimated that, one in eight children in Tanzania of less than 18 years of age had already lost one or both parents.

Sources of Trauma among Children

Participants were asked if they had experienced any traumatic events in which they felt that their life or the life of someone else was in danger, and that they experienced intense feelings of fear, horror, or helplessness in addition to the trauma. They mentioned various trauma related events they had experienced. Investigation of traumatic experience was important because life stressors were to be identified first before psychological problems.

Table 2. Participants' Traumatic Experience

Event	F	Percentage (%)
experienced accident	10	4.7
death of parent/s	13	6.2
death of other family members	6	2.8
Attack	4	1.9
witnessed accident/death	10	4.7
Sickness	4	1.9
Beaten	4	1.9
Bomb blasts	160	75.8
Total	**211**	**100**

General observations showed that bomb blasts were mentioned by 160 participants (75.8%), followed by deaths of parents (6.2 %) as well as accidents/deaths (4.7 %) and witness in accidents/deaths (4.7%) respectively.

Psychological Problems Associated with Bomb Blasts

The presence of psychological problems in relation to bomb blasts (entailed in the BSI scale) was the core area of investigation in this study. The data file was split and the total BSI scores were subjected to binned analysis so as to get the general trend of the prevalence of psychological problems.

Table 3: Presence of Psychological Problems

Psychological problems	N	Percentage (%)
Those with psychological problems	127	60.3
No psychological problems	84	39.7
Total	**211**	**100.0**

The findings in Table 3 show that bomb blasts were associated with psychological problems. About 127 (60.3%) out of 211 studied participants acknowledged the presence of psychological disorders. However, the 49 items of BIS scale were grouped into respective dimensions (symptoms) and analysed to show a clear trend of the distribution of psychological disorders as exhibited by the participants. The data file was subjected to binned analysis and run to get the total scores of each dimension (see Table 4).

Table 4. Distribution of Psychological Problems

Symptom	Status	N	Percentage (%)
Somatisation	No symptom	93	44.1%
	Presence of symptom	118	55.9%
Obsessive-compulsive	No symptom	69	32.5%
	Presence of symptom	142	67.5%
Interpersonal sensitivity	No symptom	156	74%
	Presence of symptom	55	26%
Depression	No symptom	121	57.2%
	Presence of symptom	90	42.8%
Anxiety	No symptom	34	16.3%
	Presence of symptom	177	83.8%
Hostility	No symptom	152	72.2%
	Presence of symptom	59	27.8%
Phobic anxiety	No symptom	51	24.1%
	Presence of symptom	160	75.9%
Psychocism	No symptom	142	67.2%
	Presence of symptom	69	32.8%
Paranoid ideation	No symptom	92	43.8%
	Presence of symptom	119	56.3%

The findings from Table 4 show that participants highly reported four dimensions; anxiety 177 (83.8%), phobic anxiety 160 (75.9%), obsessive-compulsive 142 (67.5%) and somatisation 118 (55.9%).

DISCUSSION

Trauma among the Studied Children

Traumatic events are part of human life, ranging from physical to emotional traumas. Generally, all participants investigated in this study had experienced some traumatic events; hence prior trauma history showed that participants had encountered different distressing events.

Prior trauma history has consistently been found to be a risk factor for psychological disorders in both children and adults. In the study conducted by Ostrowski (2008) on *Child Posttraumatic Stress Disorder in Paediatric Trauma Victims*, exclusion of children with prior trauma history resulted in a decrease in rates of psychological disorders in the sample. Thus, prior trauma history is one of the most consistent predictors of psychological disorders following exposure to a subsequent trauma (Ozer et al., 2003). One mechanism through which prior trauma experiences could increase risk for subsequent psychological disorders is that, prior stressful life events may result in persistent biological changes that could increase one's risk of developing psychological disorders upon exposure to a subsequent stressor.

Asked on the most traumatising events, about 160 participants pointed out bomb blasts as the only serious traumatic event ever occurred in their lives. This might be due to the fact that bomb blasts was a huge, dangerous and life threatening event

which covered the whole area of Mbagala, and threatened even other parts of Dar es Salaam (Joseph, 2009).

Another factor for such response could be attributed to the recency, physical proximity and severity of the event. By the time this study was conducted, about 10 months had passed since the bombs had blasted. This is a short period of time for such stressful event to get out of participants' memories. Such factors as severity and physical proximity to the event might have contributed much to exhibition of psychological disorders. Literature shows that exposure to such disasters is associated with increased prevalence of severe psychological distress across all cultures (Seedat *et al.,* 2004).

These findings on children's exposure to trauma are consistent with other related studies on trauma and psychological wellbeing in children. A study conducted by the Centre for Developmental Epidemiology in the Department of Psychiatry and Behavioural Sciences at Duke University Medical Centre on the children's rates of traumatic exposure and experience of psychological disorders in North Carolina found that a large number of children with psychological disorders had been exposed to traumatic events (Tull, 2008). The following events were the most commonly identified: witnessing a traumatic event (7.4%), learning about a traumatic event (21.4%), violent death of a sibling or peer (23.7%), being involved in a serious accident (14.5%), being exposed to a natural disaster (11.1%), being diagnosed with a physical illness (11%) and experience of sexual abuse (10.9%).

However, personal meaning of the event for the child, previous experience of trauma and appraisal of threat to life observed in this study were related to the development of psychological disorders. This is consistent with other research findings which highlight the central role of psychological factors in the development of such disorders (Stallard *et al.,* 1998).

Results of the present study indicate that being exposed to a life stressor (physical or emotional threat) is significantly associated with prevalence of some psychological disorders in children. These findings support the contention put forward by Farhood *et al.* (2006) that different types of trauma exposure have associations with psychological disorders in children and adults as well. In addition Flouri (2005) highlighted that such disorders in childhood normally are associated with exposure to both non-interpersonal and interpersonal trauma events (i.e. hearing traumatic news and experiencing physical abuse, domestic violence, etc).

Interpersonal traumatic events in this study (i.e. disserted by parent/s, beaten, witnessed accident/death, attacked, death of parents and other family members) and non-interpersonal ones (bomb blasts and accidents) were significantly associated with psychological disorders in participants. These results corroborate research with adults suggesting that exposure to interpersonal trauma also has psychosocial consequences as exposure to non-interpersonal trauma (Farhood *et al*., 2006). On the other hand, other predictors which were also investigated (age, sex, family size and socio-economic status of dependants) and tested though multiple regression

analysis showed no contribution to the prevalence psychological disorders in children.

Psychological Problems

There are many different chronic psychological adjustment problems experienced by trauma victims. Such victims are also at risk of other mental health problems such as depression, substance abuse, problems with aggressive behaviour, and more severe mental illnesses (Heather, n.d).

The main purpose of this study was to investigate the prevalence psychological disorders among children involved in traumatic events. According to the BSI scale which was used to diagnose such disorders, a total of nine dimensions of symptoms (somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, phobic anxiety, psychocism and paranoid ideation) were studied. The findings reveal that there were psychological disorders particularly anxiety and phobic anxiety.

These findings are again supported by a study conducted by Centre for Developmental Epidemiology in the Department of Psychiatry and Behavioural Sciences at Duke University Medical Centre on the children's rates of traumatic exposure and experience of Post Traumatic Stress Disorder (PTSD) symptoms in North Carolina. The study found that a large number of children with PTSD symptoms had almost twice the number of other psychiatric disorders. These other psychiatric disorders included mood disorders such as depression and anxiety disorders like generalized anxiety disorder and social anxiety disorder (Tull, 2008). Unlike Tull's findings, this study showed moderate psychological disorders as compared to PTSD. This is according to a study conducted by Messo (2010) on the prevalence of PTSD on the same population (as in this study) which revealed high (92.8%) exhibition of PTSD symptoms resulting from bombs blasts.

The findings on prevalence of psychological disorders in this study are backed by a research group from San Francisco (US) which examined the association of trauma and mental disorders. Researchers found that the most common psychiatric diagnosis was PTSD, and it was frequently comorbid with other psychiatric disorders, for example, 53% of individuals with PTSD had comorbid depression (Heather, n.d).

This study asserts that there was no any relationship between participants' background information and reaction towards traumatic events. Life stressors have been found to be part and parcel of children lives. Traumatic events have been shown to affect children psychologically in the same way or more than adults. Therefore, the present study concludes that the Mbagala bomb blasts were a serious event to the studied participants. They affected psychological life of children. The effects might have gone further to social as well as academic life of participants.

References

American Psychological Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders III*. Washington, DC: American Psychiatric Association.

American Psychological Association. (1994). *Diagnostic And Statistical Manual Of Mental Disorders IV*. Washington, DC: American Psychiatric Association.

Anderson, T. (2005). *PTSD in Children and Adolescents*. Illinois: Great Cities Institute Publication.

Armsworth, M. and Holaday, M. (1993). The effects of psychological trauma on children and adolescents. *Journal of Counseling and Development*, 72: 49-56.

Farhood, L., Dimassi, H. and Lehtinen, T. (2006). Exposure to war-related traumatic events, prevalence of PTSD, and general psychiatric morbidity in a civilian population from Southern Lebanon. *Journal of Transcultural Nursing*. 17; 333. Retrieved on 21st October, 2009 from http://tcn.sagepub.com

Flouri, E. (2005). Post-taumatic stress disorder (PTSD): what we have learned and what we still have not found out. *Journal of Interpersonal Violence*, Vol.20 No.4, 373-379. Retrieved on October 20, 2009 from http://jiv.sagepub

Hamblen, J. (2005). PTSD in Children and Adolescents. A national Center for PTSD fact sheet. Retrieved from http://www.ncptsd.va.gov/index.html,

Heather, E., P. (n.d). Screening for PTSD and Other Psychological Problems Using the Psycheval Personality Questionnaire. Retrieved from http://www.ipat.com/SiteCollectionDocuments/pdfs/wp-ptsd.pdf

http://campus.houghton.edu/orgs/psychology/ptsd/history.htm

Janoff-Bulman, R. (1992). *Shattered Assumptions: Toward a New Psychology of Trauma*. New York, NY: Free Press.

Joseph, S. (2009, June, 6). Lukuvi receives Dar bombs blast report. *The African.*

Kimaro, S. (2009, June, 3). Mbagala tragedy: a lesson on disaster management. *This Day*, pp. 18.

Machira, P. (2009, June 10). Government to release Mbagala blasts report this week. *The Guardian,* pp. 3.

Messo, I. (2010). Prevalence of Posttraumatic Stress Disorder in a Sample of Children Involved Bombs Blasts in Mbagala-Tanzania in April 2009. Unpublished Master's Dissertation, University of Dar es salaam.

Ostrowski, S. A. (2008). *Development of child posttraumatic stress disorder in paediatric trauma victims: The impact of initial child and caregiver PTSD symptoms on the development of subsequent child PTSD*. Master's dissertation, Kent State University.

Ozer, E. J., Best, S. R., Lipsey, T. L. and Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129*, 52-73.

Pellegrin, A. L. (2009). *The role of hurricane exposure and life disruption as predictors of child post-traumatic stress symptomatology following hurricane Katrina.* PhD Dissertation, Louisiana State University.

Perrin, S., Smith, P., and Yule, W. (2000). Practitioner review: The assessment of post-traumatic stress disorder in children and adolescents. *Journal of Child Psychology and Psychiatry*, 41(3): 277-289.

Seedat, M, Nyamai, V and Vythilingum, S. (2004). An overview of post- traumatic stress disorder in children and adolescents. *Journal of Primary Care Psychiatry, 6*, 43-48.

Stallard, P., Velleman, R., and Baldwin, S. (1998). Prospective study of post-traumatic stress disorder in children involved in road traffic accidents. *British Medical Journal.* Retrieved on 16th July, 2009 from bmj.com

Tull, M. (2008). Traumatic Exposure and PTSD in Children. *Archives of General Psychiatry,* 64, 577-584.

Ubwani, Z. (2008, September, 1st). Manyara regional commissioner explains why Mererani accident occurred. Retrieved on 2nd January, 2010 from http://www.thecitizen.co.tz/newe.php?id=7561.

United Nations Children's Fund. (2005). *Orphanage in Tanzania*. Retrieved on June 2010 from http://www.inwent.org/ez/articles/066825/index.en.shtml

van der Kolk, B. A. (1987). The psychological consequences of overwhelming life experiences. *Journal of Clinical Psychology*, 58, 16-24.