

Original Research Paper

Mental Health Problems and Coping among Flood Victims in Ghana: A Comparative Study of Victims and Non-Victims

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Article history

Received: 12-11-2014

Revised: 23-05-2015

Accepted: 08-08-2015

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Abstract: The occurrence of natural disasters results in loss of lives and properties. However, the short and long term focus of assistance is usually on the physical wellbeing of the victims with no attention to their accompanying mental health issues. This study examined the mental health problems and coping strategies among flood victims and non-victims in the Eastern Region of Ghana. A total of 400 respondents (200 flood victims and 200 non-victims) were sampled from two Districts, one with a history of flood and the other with no flood history. A Retrospective Cohort Design was used to determine the effects of natural disaster (flood) on the victims. The respondents were administered with the Brief Symptom Inventory and the Coping Strategies Inventory. Descriptive statistics and independent t-tests were used to analyze the data. Results from the analysis revealed significant differences in mental health problems between flood victims and non-victims. Further analysis revealed that flood victims and non-victims differed significantly in their use of adaptive and maladaptive coping strategies. It is therefore concluded from the outcomes of this study that flood victims experience significant mental health problems and therefore, psychological care of the victims must be taken into consideration in assisting in the aftermath of flood disaster.

Keywords: Flood, Mental Health Problems, Coping, Victims, Ghana

Introduction

In Africa, flood has often been the challenge confronting most countries over years as a result of various natural and human activities. For example, in 2009, several West African countries such as Senegal, Burkina Faso, Benin and Ghana were all affected by floods due to exceptionally heavy seasonal rainfalls. As a result, rivers such as the Niger, Volta, Pendjari Rivers all broke their banks and invaded homes and farms. In 2002, flood disasters were ranked the second highest cause of death (28%) in Africa after epidemics (37%) (Asian Disaster Reduction Centre (ADRC), 2002).

Climatic conditions in Ghana can be grouped mainly into two; the wet season where there is significant precipitation during the rainy season from May to August and again in September to October. The dry period is experienced usually between November and May (World Bank Group, 2011). Over the years, the common causes of flooding in Ghana are intense rainfall run-offs which occur mainly during the raining season in

Ghana, dam-burst and tidal waves. Tidal waves occurring along the coast and the rest being experienced all over the country in prominent areas like Accra which floods along the Odaw River. Pra River and Ankobra River flood in the Western Region; White Volta Floods in the Northern region; Black Volta floods in the Upper West Region; and Afram Plain floods in the Eastern and Ashanti regions (Karley, 2009).

When disasters strike, lives and properties are lost or destroyed. In the face of the cost that comes with disasters, the first thought is physical safety. However, the mental health issues among the victims such as post traumatic experiences like anxiety, stress, and depression among others are rarely heard of or mentioned. Symptoms of disturbed sleep, fear, depression and exhaustion that the victims experience can be temporary or permanent (Norris *et al.*, 2002).

Natural Disasters and Mental Health Problems

Studies indicate that, apart from the physically devastating effects of flood just as many other disasters,

psychological sequelae exist as well (e.g., Katz *et al.*, 2002). Post-traumatic stress disorder is often pertinent following disasters. Perhaps this may be due to the unpreparedness of an individual for the occurrence of such disasters. As such, disasters are said to be often sudden, unpredictable, and devastating. They thus, come with serious health/psychological problems (Yzermans *et al.*, 2005).

Several studies among disaster victims have documented varied mental health problems. In one of such studies, Vu and VanLandingham (2011) found statistically significant declines in the physical and mental health status of victims (Vietnamese Immigrants in New Orleans) of the Hurricane Katrina in a pre- and post-disaster assessment. Similarly, Du *et al.* (2009) found that the health impacts of flood disasters are wide ranging with the immediate health impact including people getting drowned, several forms of injuries and animal bites. It was further noted by Du *et al.* (2009) that hypothermia, loss of health workers, poisoning, communicable diseases, and starvation with long-term effects including poor mental health as well as starvation and poverty-related diseases are some of the effects of flood on the victims.

Galea *et al.* (2005) concluded from their epidemiological study of posttraumatic stress disorder after disasters that survivors of major disasters experience psychological problems, such as Posttraumatic Stress Disorder (PTSD). Relatedly, Priebe *et al.* (2009) studied the prevalence of PTSD and predictors of PTSD six months after an earthquake in a rural region of Italy. They used a questionnaire that was handed out to 3,000 people in the region of Molise six months after an earthquake in October/November 2002 to assess socio-demographic characteristics, aspects of the event, the experience of symptoms immediately after the earthquake, and symptoms of PTSD.

In the face of traumatic events people try to cope with the disaster by adopting several coping strategies. Some studies have reported coping among disaster victims. For instance, Schnider *et al.* (2007) examined problem-focused coping, and active and avoidant emotional coping as correlates of grief and Posttraumatic Stress Disorder (PTSD) severity among 123 college students reporting the unexpected death of an immediate family member, romantic partner, or very close friend. The results pointed out that complicated grief and PTSD severity were both significantly positively correlated with problem-focused, and active and avoidant emotional coping styles. Using path analysis to control for time since the loss and trauma frequency, they found that only avoidant emotional coping remained significant in predicting complicated grief symptoms and PTSD severity.

Additionally, Littletona *et al.* (2011) conducted a study on the association between distress (PTSD and general distress) and maladaptive coping over time among 368 college women who experienced the mass

shooting at Virginia Tech (VT). The researchers found that a reciprocal relationship between maladaptive coping and general psychological distress exists over time. In contrast, the cross-lagged model supported that PTSD symptoms predicted coping over time, but no such reciprocal relationship existed between coping and PTSD. This means that as PTSD symptoms evolve, various forms of coping tend to be used. However, coping methods adopted do not affect which forms of PTSD symptoms that will develop.

Natural Disasters in Ghana

As a developing country, Ghana is faced with natural disasters that have least warning signs. In the past few years, a substantial number of natural disasters especially floods were witnessed in different parts of the country. When these disasters strike, the immediate concern has always been relief items and places for victims to relocate. When all is over, they are left to their respective fate as mentioned above. Little (if any) mention is made of their emotional or psychological states after the incident. However, floods have always proven potential for causing severe damages (physical and mental/psychological). People's farm lands are destroyed, relatives die, houses submerge and other forms of harms are caused through these floods.

Despite the high frequency and prevalence of natural disasters in Ghana and their associated physical and mental health problems reported elsewhere in the world, no such published works exist in the Ghanaian context which examined the mental health problems associated with natural disaster and coping strategies victims adopt. The majority of the previous studies reviewed did not examine the specific mental health problems as well as the various coping strategies that victims adopt. In the same vein, the victims were not compared with any control groups to draw valid conclusions. This study therefore seeks to examine whether significant differences exist between flood victims and non-victims on their levels of mental health problems and secondly, to find out whether flood victims and non-victims differ significantly in their coping strategies. It was therefore, hypothesized that (1) Flood victims are likely to experience more symptoms of mental health problems (Brief Symptom Inventory) than non-victims; and (2) There will be significant differences in the coping strategies adopted by flood victims and non-victims.

Methodology

Population and Sample

Two districts (Kwaebibrim District and West Akyem District) in the Eastern Region of the Republic of Ghana constituted the population for this study. This population was chosen to allow for a comparison of flood victims with non-victims. The former district was affected by a recent flood in 2011 when the Birim River that flows

through the district overflowed its banks. As a result, several communities in the district got affected by the flood. According to the National Disaster Management Organization (NADMO), this district recorded the highest number of victims in the recent flood case in the region (747 adult males, 791 adult females, 893 male children and 990 female children, totaling 3421 victims). The latter district on the other hand was not affected by any of the flood cases in the country. From the two districts, a sample size of four hundred (400) was selected consisting of two hundred (200) from each district.

The snowball sampling technique is the ideal technique to use in selecting the participants from the district affected by the flood for this study. This is a non-probability sampling technique used when members of a particular population are difficult to locate (Babbie, 2005). With this technique, the data is collected on the few participants/samples of the target population that can be located. These few samples then provide information needed for the location of other members of the population they happen to know. For the second district (the one not affected by the flood), a convenience sampling technique was used. Summary of demographic characteristics of the respondents are summarized in Table 1 below.

The demographic characteristics table above indicates that most of the respondents were educated up to the secondary school level. The flooded district is Muslim dominated as their farm jobs and cattle rearing require the use of water bodies hence Muslims are more in the flood prone area selected for the study.

Research Design

A Retrospective Cohort Design was used for this study. A critical goal of disaster studies is to determine whether the incidence of particular disorder(s) is higher among an exposed population as compared to the unexposed population over a time frame. With this goal in mind, Norris *et al.* (2006) maintained that, the retrospective cohort design creates the room for addressing or achieving it. With this goal of creating the two groups-Exposed and Non-exposed, comparisons are possible.

Measures

A set of questionnaires consisting of four major parts was used. The first part of the questionnaire consisted of respondents' demographic characteristics. Part two consisted of the Brief Symptom Inventory. The third part consisted of the Coping Strategies Inventory (CSI). Part four consists of the Brief Religiosity Scale. The Inventories are described below.

Brief Symptom Inventory (BSI)

The Brief Symptom Inventory (Derogatis, 1983) is the short version of the Symptoms Checklist, Revised Version-90 (SCL-R-90) (Derogatis, 1975; 1977). The BSI is a 53-item four likert-point scale with nine

dimensions that assess psychological symptom status or distresses of both healthy and unhealthy populations. The dimensions include somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. A Global Severity Index (GSI), the average score of the 53 items of the questionnaire demonstrates a strong internal reliability of Cronbach's coefficient alpha for each of the nine subscales ranging from 0.71 to 0.85, and test-retest reliability from 0.68 to 0.91 (Derogatis and Melisaratos, 1983). The scale also shows a correlation with the SCL-90 ranging from 0.90 to 0.99 (Derogatis, 1993).

Coping Strategies Inventory (CSI)

The CSI (García *et al.*, 2007) is a 40-item likert scale with eight subscales grouped into Engagement and Disengagement components. The Engagement scale includes Problem solving, Cognitive restructuring, Social Support, and Express emotions subscales, indicating active and adaptive efforts to compensate the stressful situation. The Disengagement scale includes Problem avoidance, Wishful thinking, Social Withdrawal, and Self-criticism subscales, suggesting passive and maladaptive coping. Responses are rated on a 5-likert point including 'not at all (0), a little (1), a lot (2), very much (3), and completely (4)'. The respective items measuring the various subscales are added to get the total score for each individual for the dimensions with higher score reflecting a more use of the particular coping strategy. It has Alpha coefficients between 0.63 and 0.89.

The Brief Religious Coping Scale (Brief RCOPE)

The Brief RCOPE (Pargament, 1997) is a 14-item measure of religious coping with major life stressors. The first seven (7) items measure positive religious coping while the last seven (7) items measure negative religious coping (that is religious/spiritual struggle). The scale selected items that represent how people employ religious coping methods cognitively through thoughts and attitudes (e.g. "Saw my situation as part of God's plan"; "Thought that the event might bring me closer to God"), behaviorally through actions (e.g. "Prayed for a miracle"; "Confessed my sins"), emotionally through the specific feelings they express (e.g. "Felt my church/mosque/shrine seemed to be rejecting or ignoring me"; "Sought God's love and care."), and relationally through actions that involve others (e.g. "Offered spiritual support to family or friends."; "Sought a stronger spiritual connection with other people."). The reliability of the scale is reported to be ranging from a Cronbach's alpha of 0.80 to 0.92. Scoring is done on a four likert-point for positive and negative subscales by adding up the responses on the first 7 items and the last 7 respectively. Responses range from 'not at all' to 'a great deal'. High score on either side reflects a high positive or high negative religious coping for the two subscales respectively.

Table 1. Summary of demographic characteristics of the respondents in the study

Variables	Victims N (%)	Non-victims N (%)
Gender		
Male	100 (50%)	100 (50%)
Female	100 (50%)	100 (50%)
Age [range, 18-87years]	36.55 (SD = 13.87)	34.57 (SD = 11.93)
Education		
No formal education	4 (2%)	17 (8.5%)
Primary	91 (45.5%)	19 (9.5%)
JHS	46 (23%)	39 (19.5%)
SHS	48 (24%)	107 (53.5%)
Tertiary	11 (5.5%)	18 (9%)
Marital status		
Single	127 (63.5%)	112 (56%)
Married	55 (27.5%)	73 (36.5%)
Separated, divorced, widowed	18 (9%)	15 (7.5%)
Religion		
Christian	58 (29%)	166 (83%)
Muslim	139 (69.5%)	20 (10%)
Traditionalist	3 (1.5%)	14 (7%)

Data Collection Procedures

The researchers obtained Ethical clearance from the Institutional Review Board at Noguchi Memorial Institute for Medical Research, University of Ghana, Legon. A consent letter was sent to the leaders of the communities under study for approval. In addition to that, consent forms were designed and presented to every individual who agreed to participate in the study. When granted permission by the leaders, the respondents were approached to seek their consent to take part in the study. Respondents who agreed to participate and have the ability to read and write English were made to self-administer the scale (i.e. to read and respond to the items on the scale on their own with little or no assistance from the researchers). Participants who could not read and write English were interviewed. The completed questionnaires were retrieved for coding and data analysis.

Data Analysis Techniques

The stated hypotheses were tested with use of independent t-tests.

Results

To test the first hypothesis that flood victims are likely to experience more symptoms of mental health problems (Brief Symptom Inventory) than non-victims, the independent t-test was used to compare the two groups using the SPSS. 20.00. The results are summarized in Table 2 below.

The results from Table 2 show that hypothesis one is supported as victims reported higher overall psychological distress (Global Severity Index) than non-victims. The victims also reported significantly higher levels of Obsessive- Compulsion, Depression, Anxiety, Hostility, Phobic-Anxiety and Paranoid Ideation. However, no significant differences were observed between victims and non-victims in their reported levels of Somatization, Interpersonal Sensitivity and Psychoticism.

Further, to test the second hypothesis that there will be significant differences in the coping strategies adopted by flood victims and non-victims, the independent t-tests were computed and the results are summarized in the Table 3 below.

On the positive or adaptive coping subscales, significant differences were found between victims and non-victims in their use of Expressive Emotions and Cognitive Restructuring but did not differ significantly in their use of Problem Solving and Social Support. Similarly, positive religiosity is significantly lower among the victims than the non-victims signifying that non-flood victims make use of more positive religiosity than victims.

On the maladaptive/negative coping subscales significant differences were observed between flood victims and non-victims in their use of self-criticism, wishful thinking and problem avoidance. However, no significant differences were observed between flood victims and non-victims in their use of social withdrawal. Similarly, flood victims and non-victims did not differ significantly in their use of negative religiosity.

Table 2. Summary of independent t-tests of differences in mental health problems between flood victims and non-victims

Dependent variables	Victims (n = 200)	Non-Victims (n = 200)	df = 398	t	ρ
	Mean (SD)	Mean (SD)			
Somatization	1.03 (.23)	1.02 (.31)		00.43	0.33
Obsessive-compulsion	1.27 (.26)	0.93 (.32)		14.85	0.001**
Interpersonal sensitivity	1.02 (.44)	1.01 (.42)		00.25	0.4
Depression	1.23 (.27)	0.98 (.35)		08.04	0.001**
Anxiety	1.29 (.33)	1.02 (.37)		07.64	0.001**
Hostility	1.42 (.21)	1.04 (.35)		13.18	0.001**
Phobic-anxiety	1.21 (.29)	1.07 (.38)		04.02	0.001**
Paranoid ideation	1.41 (.28)	1.06 (.34)		11.23	0.001**
Psychoticism	1.08 (.39)	1.04 (.38)		01.01	0.16
Global severity index	1.23 (.16)	1.02 (.26)		09.81	0.001**

Bonferroni Adjustment, p = 0.005; *p<0.005

Table 3. Summary of independent t-tests of differences in coping strategies (coping strategies inventory and the brief religious coping scale) between flood victims and non-victims

Dependent variables	Victims (n = 200)	Non-victims (n = 200)	df = 398	t	ρ
	Mean (SD)	Mean (SD)			
Adaptive coping					
Problem solving	2.06 (.82)	2.25 (.76)		02.34	0.01
Expressive emotion	1.72 (.80)	2.44 (.62)		10.06	0.001**
Social support	2.06 (.67)	2.17 (.69)		01.55	0.06
Cognitive restructuring	1.87 (.73)	2.13 (.49)		03.91	0.001**
Maladaptive coping					
Self-criticism	2.79 (.50)	1.65 (.50)		22.73	0.001**
Wishful thinking	2.60 (.49)	1.86 (.50)		15.04	0.001**
Problem avoidance	2.83 (.58)	1.49 (.61)		22.43	0.001**
Social withdrawal	2.03 (.79)	2.15 (.79)		01.50	0.07
Positive religiosity	2.79 (.87)	3.29 (.89)		05.67	0.001**
Negative religiosity	2.92 (.91)	2.76 (.84)		01.87	0.03

Bonferroni adjustment, p = 0.005; **p<0.005

Discussion

The negative impacts of natural disasters on the lives of victims are of great concern to all stakeholders as both physical health and mental health of the individuals are significantly affected. Natural disasters like flood have become a common occurrence in our society with their associated problems. This study sought to examine the mental health problems and coping strategies among flood victims in the Eastern Region of Ghana by comparing them with non-victims. Two main hypotheses were tested. Firstly, it was also hypothesized that flood victims are likely to experience more symptoms of mental health problems (Brief Symptom Inventory) than non-victims. The results indicated that the flood victims actually reported significantly higher levels of obsessive-compulsion, depression, anxiety, hostility, phobic anxiety, paranoid ideation (six in all) and the global severity index than the non-victims but not on somatization, interpersonal sensitivity and psychoticism. This is in consonance with past researches (e.g. Du *et al.*, 2009; Galea *et al.*, 2005) that reported higher distresses among disaster victims. Galea *et al.* (2005) for instance reported in an epidemiological study that, victims of disasters suffer psychological problems/distresses. Similarly, Du *et al.* (2009) indicated that the health

impact of flood disasters can be wide ranging to include poor mental health. However, Du *et al.* (2009) did not examine the specific mental health issues that confront flood victims which the current study did in order to inform specific intervention programs for the victims.

Disasters indeed leave behind high levels of anxiety and fear inducing memories and feelings among the victims. They may fear little things that may remind them of the trauma and wonder if the same event is not likely to occur again. Commonly related to the anxious feelings are obsessive-compulsions in which people indulge in repetitive and ritualistic behaviours for fear of danger and accompanying emotional discomfort (DSM IV); phobic anxiety and paranoid ideations.

Another distress found among the victims which is higher than among the non-victim is depression. Depression is very much associated with anxiety. According to Fainman (2004), anxiety and depression are very much related symptomatologically (motor and somatic effects, distortion in thinking, learning, perceptions, selective attention, etc) and neurobiologically (blunted cortisol response to adrenocorticotrophic hormone (ACTH), blunted Growth Hormone (GH) response to clonidine, and blunted Thyroid-Stimulating Hormone (TSH) and prolactin responses to Thyrotropinreleasing Hormone (TRH)) so

that the presence of one results in the occurrence of the other. With people who have experienced a traumatic disaster like flood where valuables and lives have been lost, it is very probable for them to develop fear for the situation and subsequently drop into a depressive mood.

Threat to life must surely induce some emotional arousal and discomfort. This is clear in the finding in this study that flood victims exhibit more hostility than non-victims. Just as the experience of the life threatening event/disaster and loss of valuables lead to anxiety and depression, it also can provoke frustration and eventual anger or hostility. According to Stewart *et al.* (2010) hostility permeates thoughts, feelings or actions that are characteristic of anger. Often, hostility is synonymous with anger and anger is a shared feature of many psychiatric diagnoses (Beckham *et al.*, 2000). Anger in its normal domain may be more associated with survival instinct. However, it becomes unacceptable when it outstretches its bounds.

The flood victims also exhibited Paranoid ideation, a disordered thinking characteristic of projective thoughts, hostility, suspiciousness, grandiosity, fear of loss of autonomy, and delusions (Stewart *et al.*, 2010). This also looks very much related to fear and the sense of danger within them. By this, victims may be demonstrating some feeling of insecurity. The danger is that they may even be suspicious of others being capable of causing them harm.

Furthermore, the second hypothesis examined the differences in the coping strategies between flood victims and non-victims. It was found that flood victims scored significantly lower on all the adaptive coping strategies such as expressive emotion, cognitive restructuring and positive religiosity than non-victims except problem solving and social support. On the other hand, flood victims scored significantly higher on all the maladaptive coping strategies such as self-criticism, wishful thinking and problem avoidance than non-victims except negative religiosity and social withdrawal.

It is interesting to find that victims of this flood disaster are coping more negatively than positively with their experience. According to Schooler (2001), disaster victims can use all sorts of coping mechanisms ranging from blocking the thoughts, eliminating the source, reducing the threat to utilizing existing social support systems. Researches such as that of Schnider *et al.* (2007) often reveal that disaster victims adopt several coping strategies. Their study specifically reported the persistent use of avoidant coping following disaster experiences. Like the findings of this current study, Littletona *et al.* (2011) also found that maladaptive coping is much associated with people with mental health effects from disasters. As seen here, the flood victims recorded significantly higher score on most of the maladaptive coping methods than the non-victims compared to the adaptive methods. The flood victims would have a lot to mourn for. This is capable of distorting their appraisal of the circumstance at stake. As

such, their ability to manage the stresses or distresses that accompany the situation would be disturbed.

Social support as a coping strategy did not differ among the victims and non-victims. Indeed, social support is a good thing (O'Donnell and Steptoe, 2007). As it stands, social support can be seen as one of the important and commonest coping methods utilized by many people. The Ghanaian context which is more collectivist than individualistic makes the interdependence on each other very necessary and common. Therefore, people may be typical in using a lot of social support strategies whether in times of major disasters or not. Thus, it is not surprising that no significant difference exist between flood victims and non-victims in their use of social support as a coping strategy.

Another coping method that remained common among both victims and non-victims is social withdrawal. For the victims, the period of the disaster is a time many people will come around to sympathize. Isolation or withdrawal may not be any good option. The utilization of support from others is automatic within the culture and so one may not remain withdrawn, not by choice but the culture offers support and one is compelled to accept it.

The findings of this study have implications for providing assistance to people affected by natural disasters especially flood victims. The first implication is that flood victims experience severe psychological problems and any form of assistance must make room for psychological interventions. Thus, providing victims with relief items should not be the only priority but their short and long terms physical and mental wellbeing should be taken into consideration. Additionally, the National Disaster Management Organization should be well resourced in terms of personnel and financial resources to deal with the negative consequences of natural disasters especially floods and persons at risk of flood should be educated on the negative physical and mental health consequences of natural disasters especially floods.

Conclusion

This study is one of the few that examined mental health problems and coping among flood victims and as a result, it provides the basis for further research in this direction. The results also provide some empirical evidence which can serve as basis for reforms in dealing with victims of natural disasters especially flood. The study is however limited to the Eastern Region of Ghana and cannot be generalized to the entire country as there are interethnic differences in terms of how people react to situations. Future studies should therefore, examine how coping and other characteristics of the flood victims affect their mental health problems. The level of mental health problems and associated factors should also be examined to inform intervention plans for victims.

Acknowledgement

We would like to acknowledge the Chiefs, Elders and Community members of Oda and Adeiso Communities in the Eastern Region of Ghana for their participation in this research. We thank Professors C.C. Mate-Kole and L.A. Ofori-Atta and Dr. K. Nyarko for their technical guidance.

Author Contributions

Emmanuel Dziwornu: ED conceived the study, designed the study, collected data and performed statistical analysis. ED reviewed the drafted manuscript.

Nuworza Kugbey: Conceived the study, designed the study, performed data analysis and drafted the manuscript.

Conflict of Interest

The authors declare no form of conflict.

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