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Lived Experiences of Adolescents under Climatic Change: Case of Chimanimani, Zimbabwe during and Post-Cyclone Idai

***Chigevenga Rosemary*[1]*; *Grizzah Briges*[2]**

[1]*Department of Psychology, Great Zimbabwe University, Zimbabwe.*

[2]*Counselling Psychology, Zimbabwe Airforce, Zimbabwe.*

***Corresponding Author(s): Chigevenga Rosemary**

Department of Psychology, Great Zimbabwe University, Zimbabwe.

Tel: +263773403912 Email: rosychev@gmail.com

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Abstract

Cyclones are seemingly on the rise in modern Zimbabwe and adolescents are amongst the most affected. Cyclone Idai hit Zimbabwe in March 2019 causing devastating effects in many areas. It is from this background that this research was conducted to explore the lived experiences of adolescents in the wake of climate change. A qualitative approach using a phenomenological research design was utilised in exploring adolescents' experiences. A sample of 20 adolescents from Chimanimani area was selected using convenience sampling. Data was collected using in-depth interviews. Thematic analysis was used in presenting and analysing the data obtained. It came out that Cyclone Idai left some adolescents exhibiting signs and symptoms associated with psychological problems such as depression, Post Traumatic Stress Disorder (PTSD), anxiety, prolonged grief, mourning and bereavement. These were exacerbated by socio-economic challenges brought about by this climate change. The researchers concluded that adolescents' emotional, cognitive and behavioural development could be negatively affected by climate change. Basing on the conclusions, the study recommended that the government should set up social and child protection systems that are sensitive to disasters. Disaster response must adopt a holistic approach when addressing the needs of adolescents. A fund should be set aside for adolescence disaster responders and social service departments for them to be well prepared. In addition, adolescents should be proactive in learning about climate change and developing resilience in times of disaster outbreaks.

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Introduction

Climate change resulting in natural disasters such as cyclones is amongst the global challenges that the world is increasingly experiencing and trying to address. The effects of climate change are experienced universally cutting across all age groups however, adolescents are also found amongst the most reported victims of this phenomenon. Zimbabwe just like any other nations is facing her own share of cyclones and related disasters. The researchers of this study were therefore prompted to explore the lived experiences of some adolescents in Zimbabwe who were the survivors of Cyclone Idai, a disaster that wreaked havoc mainly in the eastern regions of the country.

Background to the study

Cyclone refers to a weather phenomenon that consists of a large-scale air mass, which rotates around a strong low atmospheric pressure. The low atmospheric pressure region is the home of the cyclone. Hence, it can be tropical or extra tropical cyclone. The term "cyclone" is derived from a Greek word "cycles" which means coiling of snake. It is characterised by inward spiraling winds, which rotate about a zone of pressure [1].Typical cyclones are referred to by different names depending on where they originate in the world. Hurricanes occur in the Atlantic Ocean and eastern North Pacific Ocean. Typhoons occur in the western Pacific Ocean and tropical cyclones occur in the South Pacific and Indian Ocean [2]. According to a 2004 study by United Nations (UN) cited by the Herald News Paper [3], cyclones and floods impact over half a billion people every year worldwide and might impact two billion by 2050 of which a disproportionate number live in Asia, with more than 45% of all floods disasters world wide and 95% of cyclone floods related deaths in the world. Miller [4] reported that at least 30 tropical cyclones have affected the Southern African mainland. Three countries in Southern Africa - Tanzania, Mozambique and South Africa – border the Indian Ocean. Other inland countries also experienced the effects of typical cyclones, including Botswana, Eswatine, Malawi, Namibia, Zambia and Zimbabwe.

Natural disasters present a significant and growing threat to the well-being of adolescence and children at large. Every year, 175 million children globally are expected to be affected by natural disasters, including floods, cyclones, droughts, heat waves, severe storms and earthquakes [5]. According to Philipsborn and Chan [6], this generation will bear a major portion of the burden and cost of mitigating and adopting to climate change and natural disasters. Adolescence will be harder hit than adults will, simply because 88 per cent of them live in developing countries and the poor they are the greater the burden. Adolescence are especially vulnerable to the effects of natural disasters. Their reaction span on a continuum, from distress and transient emotional and behavioural changes to impaired functioning and enduring psychopathology. As stated by Kar [7], the number of children seriously injured or dying from such disasters is unknown, but immense and added to this are mental consequences. The experience of loss is universal however, adolescence are amongst those who experience various barriers on their journey to recovery from disasters.

Climate change threatens human health, including mental health, and access to clean air, safe drinking water, nutritious food, and shelter. This change affects everyone at some point in their lives however, the adversity of the change differs depending on people's areas of residence, their age, health status, income and occupation. Children and adolescents are especially vulnerable to the impacts of climate change because of their growing bodies, their unique behaviours and interactions with the world around them and their dependency on caregivers. To make matters worse, the frequency, intensity and severity of natural disasters are increasing, worsening the harmful effects on adolescence.

Children's growth and development from infancy to adolescence stages make them more sensitive to environmental hazards related to climate change, for instance lung development occurs during childhood to adolescence which makes them become more sensitive to respiratory hazards. Climate change worsens air quality due to warming temperatures that make it easier for ground-level ozone to form which affect adolescents' physically and emotional development. It can also lead to an increase in the frequency, severity and duration of some extreme weather events, increasing risks to adolescence mental health. When extreme weather causes injuries, death, or displacement, adolescence may have difficultly controlling their emotions, may not perform as well in school, and may face depression, anxiety and post-traumatic stress. While many adolescence show resilience to traumatic events, mental health impacts may last into adulthood, especially if left untreated. Thus exploring the experiences that adolescents go through during and after the outbreak of natural disasters may help in promoting preparedness among nations.

Adolescence behaviours and interactions with the world around them may increase their exposure to certain health threats. Health threats may include exposure to allergens, extreme heat, insect and tick-related diseases and contaminated water. These threats may particularly affect those with disabilities or special health needs who rely more on their parents or caregivers for basic needs like nutrition, shelter, hygiene, and clothing. Children and adolescence separated from their caregivers due to adverse climate changes like cyclones, storms and floods, are at increased risk of health impacts, thereby affecting their psychosocial development and wellbeing

Brooks and Arsalan [8], highlight that climate change ranks among the most important dynamics shaping current and future livelihoods of adolescents. This is the case especially in low-income countries with rapid population growth and hence concentration of young people. Henceforth interventions targeting adolescence, especially in rural areas needs to address climate change as its effects bring negative developments psychological, physically, socially and economically. Thus, climate change is a developmental issue because most countries in which the adolescence population accounts for sizable share of total population also depends on agriculture, a sector that is highly exposed to climate change.

Chapungu [9], holds the view that African governments and relief agencies are often overwhelmed by the responsibility of ensuring community relief and recovery from climate-related disasters, given the unforeseen demand on resources. Most interventions have a short-term alleviation impact while long-term goals fall away. Although governments and various organizations assisted with providing shelter, health facilities, camp management, food and clothes, among other necessities, the affected individuals' long-term goals and aspirations have been derailed [10]. Therefore there is need to put them back on track, especially for adolescence who still have a long way to go in life.

Zimbabwe experienced a tropical cyclone termed Cyclone Idai during March 2019. Flooding and landslides caused damage

to homes, fields, schools and roads and disrupted livelihoods, particularly in Chimanimani and Chipinge Districts. Seven other districts in Manicaland, Masvingo and Mashonaland East Provinces were also affected but did not suffer to the same extent in terms of infrastructure damage, loss of human life and livelihood disruptions [11]. A situation report by United Nations International Children's Emergency Fund(UNICEF) in 2019 states that Cyclone Idai affected 270 000 people in Zimbabwe, 51 000 were displaced, more than 340 died and many others went missing. Scores of children were orphaned, roads and bridges in Chimanimani and Chipinge were severely damaged, some 1 500km of the road network was rendered unusable for months, affecting market access and access to other essential services like schools and health care centres. Livelihoods were disrupted and 140 schools were affected. Housing, health, irrigation and other agriculture facilities were damaged, as were forests and protected areas. Those displaced by floods in Chimanimani district have sought refuge in informal camps or being hosted by neighbours. Within the camps and host families, women and adolescence especially girls, traditionally tasked with care and domestic work had to take additional responsibilities. In an area already affected by high rates of HIV infection among adolescence, plus teenage pregnancies and child marriages, the risk especially for adolescence increased [12]. It is against this background that researchers of this study sought to hear the voices of the adolescents that were exposed to Cyclone Idai.

Literature review

Climate change and adolescents' mental health

Children and adolescents are more likely to have physical and mental health development problems when they get exposed to violence or trauma after the disaster. After the 2010 Haiti earthquake, adolescents who experienced violence, compared to their peers reported higher mental distress and suicidal ideation [13]. In addition, experiencing multiple stressors in the recovery period such as parents changing or losing jobs, moving to a new home or school or the death or illness in the family may hinder development in all dimensions [14]. Weems et al [15] highlighted that children and adolescence who are members of marginalised or underserved groups, living in temporary housing or unsuitable housing are particularly vulnerable because such social context amplify the chance that they will experience the risk factors mentioned above. Exposure to multiple potential life threatening disaster events like seeing trees fall, being injured or witnessing someone being hunt also bring with it physical and mental health development problems in adolescence [16]. La Greca et al., [17] supported this by highlighting that when a disaster affects parents, caregivers , other adults such as teachers, protection and support systems are eroded rendering them to more climate change related risks.

Common adolescent mental health conditions associated with exposure to natural disasters

The amount of exposure to the disaster is highly related to the risk of mental health conditions such as depression, Post-Traumatic Stress Disorder (PTSD), anxiety and in some situations prolonged grief. The United States of America Department of Veterans Affairs [18] states that at highest risk are primary survivors meaning those that directly experience the devastating effects of the disasters. These are followed by those in close contact with victims or survivors. At lower risk of lasting impact are those who only had indirect exposure such as receiving news of the severe damage. Disaster recovery is more stressful when children are present at home, as they need care and support.

Depression has been linked to climate change related disasters. According to the object loose theory, if a person lose something of value to him or her, there are chances of that person to become very insecure which can culminate into depression. The National Institute of Mental Health (NIMH) [19], states that cognitive theories argue that depression can be a result of cognitive biases that is processing information in a biased way (analogical way) and negative schemas that is seeing things in a negative way. A combination of these may result in negative evaluation of the self and future cognitive triad, an experience which survivors of climate change may experience. Adolescent survivors of Cyclone might have gone through this experience too.

Reviews concerning adolescence affected by natural disasters report that depression prevalence rates range from 7.5 to 44.8 percent across studies [20]. Among a sample of adolescents who lived through the 2011 Tornado outbreak in Alabama and Missouri, 7.5 percent met the diagnostic criteria for major depressive episodes following the disaster [21]. In a study conducted six months after an earthquake in China, 24.5 percent of adolescents reported clinically significant depressive symptoms [21]. A similar rate of depressive symptoms was observed after a wildfire in Greece, and a somewhat lower rate of 17.6 percent was reported after a cyclone in India [22]. Exposure to Hurricane Georges was associated with meeting diagnostic criteria for several different depressive disorders, with 4.1 percent of adolescence reporting major depression and 1.1 percent reporting dysthymic disorder, which is characterized by mood disturbance over a duration of more than 1 year in children as well as transient periods of normal mood [23].

Morrissey and Reser [24] noted that adolescence depression is a burgeoning illness that may be uniquely sensitive to changes in global climate. Adolescence might be particularly vulnerable to climate-induced depression when faced with parental injury. Although there is still a dearth of literature related to this, these same authors have found that fluctuations in climate change affect both the onset and severity of depression in adolescence at a population level. Given that some adolescents were exposed to loss of parents, relatives, friends, houses and property during cyclone Idai in Chimanimani there is a high likelihood that the survivors may show depressive tendencies. Such mental health conditions might have caused them to perform poorly in school, thus distorting their future goals. Images of what transpired during the onset of the disaster may linger in their minds for long.

Post-Traumatic Stress Disorder (PTSD) has been witnessed in some adolescents after exposure to natural disasters. PTSD symptoms, which can contribute to problems in adolescence development and interfere with normal functioning, have been reported in a significant percentage of children exposed to a variety of different natural disasters. Studies have found that 6 percent and as many as 57 percent of samples of adolescence exposed to a 2004 tsunami, 4.5 percent of adolescence exposed to earthquakes, and 35 percent of adolescence exposed to hurricanes experienced significant PTSD symptoms [25]. The variety in the percentages could be attributed to study sample age and gender differences as well as to disaster experience and loss, including the type and severity of the natural disaster and the associated loss experienced by youth, whether loss of loved ones, home, or school [26]. Another study found that

about 20 percent of children affected by Hurricane Katrina had PTSD symptoms and also experienced symptoms of anxiety and depression following the disaster, while chronicity of these symptoms rarely exceeded 30 percent of the sampled population [27].

Research conducted in schools following bushfires in Australia found that students had elevated levels of PTSD, similar to those of global rates among adolescence who had experienced natural disasters worldwide [28]. In a sample of adolescents who lived through the 2011 Tornado outbreak in Alabama and Missouri, about 6.7 percent met the diagnostic criteria for PTSD following the disaster [21]. In a sample of 905 adolescence exposed to Hurricane Georges in 1998, 1.1 percent reported PTSD [23]. Adolescence diagnosed with post-disaster PTSD often experience a decrease in quality of life, which may correlate with negative behaviours in school, including difficulty concentrating, disruptive behaviour, and poorer grades [28].

Literature has also pointed to anxiety disorder as another mental health condition which was found to be associated with exposure to natural disasters. Anxiety disorders are generally characterized by excessive worry and apprehension about the future. Anxiety often co-exists with other disorders such as depression and this has seen cited by Adams and Sutker [29] stating that it may be obscured by these other disorders. de Jong et al [30], mentioned that exposure to disasters may lead to the development of anxiety disorders such as separation anxiety, panic disorder, and specific phobias. In a study conducted after Hurricane Georges in the Caribbean and Mexico, about 6 percent of adolescents ages 11-17 met the symptom criteria for separation anxiety, 3.2 percent for social phobia, 1.1 percent for panic disorder, and nearly 2 percent for generalized anxiety disorder [23]. Six months after an earthquake in China, 40.5 percent of adolescents had reported clinically significant anxiety symptoms; a similar rate of anxiety symptoms was observed after a wildfire in Greece, and somewhat lower rates of anxiety symptoms of 12 percent were reported after a cyclone in India [31].

Basing on this background, the researchers of this study assumed that symptoms of some of these mental health conditions were likely to be exhibited by adolescent survivors of Cyclone Idai. These conditions had the potential to impact negatively the normal behaviours of some children resulting in poor school performance, including difficulty concentrating, disruptive behaviour and poorer grades, poor relations with family and peers among others.

Theoretical framework

The study was guided by Bronfenbrenner's ecological system theory, which has become popular in explaining the influence of social environments on human development and children at large. The theory argues that the environment a person grew up in affects every facet of his/her life. Social factors determine the way of thinking, emotions, likes and dislikes. Bronfenbrenner noticed that a child's nature depends on the context they grew up in. In this regard he proposed that the environment is made up of five interrelated systems (micro, meso, exo, macro, chrono).

Microsystem is made up of the groups that have direct contact with the child. Family and school are some of the most important ones. The relationship between this system and a child's development is obvious; however, the influence can go both ways [32]. Climate change is bringing with it disasters such as cyclones, heat waves and draughts. These are killing people of all ages depending on the severity. This affects adolescence development as some will be orphaned and will not be able to attend school. On top of that, adolescence need guidance from elders or care givers who sometimes might have lost their lives in natural disasters, thereby living children without supportive backgrounds. The education system is disrupted also compromising the education standards of adolescents, which can result in a distorted future.

Mesosystem is made up of relationships between the groups from the first system, thus the parent and teacher relationship, for instance has direct impact on the child [32].The mentioned relationships between the parents and teachers is being eroded by the effects of climate change and natural disasters. Parents might die, as well as teachers resulting in non-existence of the relationships. It then automatically means that children and adolescence will also have a weak support back up rendering them to social and psychological challenges which disturb their development in all dimensions.

When it comes to the exosystem, it involves factors that affect a child's life. However, the elements of this system do not have direct relationship with them. An example of an exosystem would be the company where the child's parents work. This would affect the parent's point of view, how much free time they have and their well-being [33]. Droughts being caused by climate change are the basis of socio-economic hardships in an agro-based economy like Zimbabwe. This have led some Zimbabwean parents to migrate, joining the diaspora in many countries leaving their children behind in the home country [34]. Suarez-Orozco [35] found that separation creates challenges to family relations and child development, that a relationship between separation and depressive symptoms exists, and that although painful, separation is significantly affected by circumstances and context.

Macrosystem contains those cultural elements that affect the child and everyone around them. For example cultural values or an official religion [36]. In this case, the macrosystem influences development because it determines how the other systems can express themselves. Conversely, culture may help communities to survive during disasters and may not represent a barrier for disaster risk reduction. This was evident during the Indian Ocean Tsunami in December 2004, where communities and individuals who had indigenous knowledge of Tsunamis were more likely to survive the event [37]. For example, the Moken community in Thailand identified signs such as unusual behaviour of animals and birds, as well as low tide, as indications of a Tsunami based on their traditional stories. This enabled the community to move away from the sea towards protective areas [37]. Therefore, culture can be in a position to help not adolescence only, but people of all ages to develop knowledge, which can be the foundation for physical, social, economic growth and development.

Chronosystem refers to the stage of life that a person is in regarding the situation they are going through. For instance the death of a loved one has a very different impact on young persons as opposed to an elderly person [38].This generation of adolescence is experiencing climate change which is causing disasters, killing their loved ones and destroying property. The current situation is causing prolonged grief, mourning and bereavement among adolescence survivors.

Purpose of the study

The study sought to explore adolescents' lived experiences in the wake of climate change specifically how they emotionally and cognitively reacted after being exposed to Cyclone Idai. This was done to establish the level of risk of development of mental health conditions in adolescents exposed to natural disasters.

Research objectives

To explore the emotional reactions of adolescence to Cyclone Idai.

To explore the cognitive reactions of adolescents to Cylone Idai.

To identify symptoms of mental health conditions commonly associate with adolescents' exposure to natural disasters.

Methodology

Research approach

The study utilised a qualitative research approach. Creswell and Creswell [39], define qualitative research as an inquiry process of understanding social or human problems based on building a complex, holistic picture formed with words, reporting detailed views of informants and conducted in a natural setting. In other words, it is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.

Research design

A phenomenological research design was utilised, as the objective of the study was to explore the lived experiences of adolescents' during and post-Cyclone Idai. In other words, the focus was on the adolescents' subjective experiences and interpretations of the world during this natural disaster. The research was an exploratory case, which according to Mackey and Gass [40], is one of the most common qualitative approaches to research which aims to understand social phenomenon within a single or small number of naturally occurring settings.

Population and sampling

The target population were adolescent survivors of Chimanimani who witnessed and were affected by Cyclone Idai. A sample is a representative of the subset of the population chosen for data collection with the aim of generalizing results to a larger population. A total of twenty adolescence participants aged 13-19 years were selected using a non-probability sampling technique namely convenience sampling. The total number was determined by data saturation.

Data collection instruments

In-depth interviews were used in collecting data. An interview guide was developed by the researchers in line with the research objectives. This instrument was used as it can easily help in exploring lived experiences of the target group since it gives room for probing hence getting to the depth of the phenomenon of interest. The interview responses were audio recorded for transcription, which was done within 48 hours after data collection. To complement the audio recordings the researchers also used notebooks. The researcher's notebook was used to write down themes that come up during the data collection process and also to note any other observations noted during data collection.

Research procedure

In conducting the structured interviews, the research instrument was translated to Shona in order to get in-depth information without losing meaning. The participants to be interviewed were accessed through Village Heads and local school authorities. Informed consent was sought from parents and guardians of the targeted adolescents through signing of consent forms and the children also signed assent forms. This was done to have easy access and develop a sense of trust from participants and their guardians or care givers. In addition, due to the sensitivity nature of the study a psychologist was on standby to offer psychological services to those who could become emotionally overwhelmed.

The duration for data collection was two weeks; this depended on the availability of targeted participants. Interviews were conducted on one on one basis, with participants through a prior established appointment. The data collection was done simultaneously with the recording process. However, recording was only done after getting participant consent.

Findings

Thematic data analysis was utilised in analysing data. Denzin and Lincoln (41) states that thematic analysis emphasizes pinpointing, examining and recording patterns or themes within data. Three major themes explained below were established.

Emotional reactions

adolescents panicked a lot, as adults who they depend on were also helpless during the disaster. Some adults were brave enough, but the situation was out of control. This panicking can be regarded as anxiety. After the disaster up to the period this study was conducted, most adolescents were living in fear/anxiety with memories of the disaster haunting them. The participants reflected that in some instances this was caused by loss of loved ones, some of which were neither found nor given proper burial. More so, adolescent survivors experienced feelings of danger or impending doom and unrealistic ideas of danger leading to inability to cope with stress. These are symptoms of anxiety according to the DSM-5.

'The experiences were so horrific that whenever I think of them I shiver.'

'I am so afraid that sometimes I feel like the water will revisit and maroon me just like what it did to my parents.'

Mood changes

adolescents reported that after the disaster they started to experience sadness, feeling helpless and hopeless and to some extend feeling worthless. According to the DSM-5 this is linked to depression thus the majority of them expressed depressive tendencies. This was reflected in the following statements:

'I have no hope for the future. All our belongings and my parents have vanished, so who will take care of my needs.'

'Life is very unfair. We have been left with nothing, absolutely nothing and we have nowhere to start. My life has been shattered. I keep wishing for death as I see no reason for living.'

Cognitive reactions

Some of the participants reflected that it was taking time for them to accept the unfortunate events and this caused persistent recurrence of the horrible memories of the disaster reflect-

ing prolonged grief. To add on to that, the adolescent survivors confirmed that they were having recurrent, unwanted distressing memories of the traumatic event, trying to avoid things or talking about the traumatic event and also avoiding places that remind them of the traumatic event. According to the DSM-5 this is linked to Post Traumatic Stress Disorder (PTSD).

'I keep on visualising the events of that terrible night. I have lost my loved ones and it's difficult for me to quickly accept the loss as the remains of some of them have not been found up to date.'

'I do not want to visit where we usually used to live as that area disturbs my thinking. It triggers memories of that monster, Cyclone Idai.'

'Cyclone Idai has affected me seriously. Each time I see dark clouds in the sky or hear the sound of thunder, I start visualising the events of that fateful night and it gives me a fright.'

In addition, some of the adolescents started to self-isolate as they found themselves lost in deep thoughts of the loss they had experienced. Such withdraw led others to contemplate self-harm actions while others develop suicide ideation. The following statements help to substantiate this point:

'After the Cyclone Idai experiences I have found myself preferring to be alone most of the times. This gives me room to ask the Almighty why I had to go through all this.'

'Cyclone Idai was really devastating. Sometimes I contemplate ending my life because this is a life not worth living.'

The participants also narrated how they felt guilty for surviving when their close relatives have died. Most of them reflected self-blame for the death of their loved ones. They felt as though they could not do much to rescue their significant others whom they saw being marooned while they watched helplessly. Narrations from the survivors reflected guilt towards failure to do something as well as survivor guilt. The following statements were passed:

'I wish I could have put more effort to rescue my helpless mother. I could see her being washed away by the water as I helplessly hang on a tree branch. I do not think I will ever forget that scene.'

'Many times I ask myself why I survived when others have died. I feel like I have cheated my deceased loved ones. How could I be the only one to survive? It's a mystery which will never be answered.'

Discussion of findings

The study found out that many adolescents panicked a lot, as adults whom they depended on were also helpless during and after the disaster. Some adults were brave enough, but the situation was out of control. Linked to this, Lai et al., [14] mentioned that adolescents are more likely to develop physical and mental health problems if they are exposed to violence or trauma as was the case after the 2010 Haiti earthquake when adolescents who had been exposed to the disaster reported higher mental distress compared to their peers who were not exposed .

Adolescent survivors of Cyclone Idai in Chimanimani are at risk of continuing psychological distress and behavioural changes related to their experience of trauma. They confirmed that their experiences of feelings of sadness, hopelessness, helplessness worthless, behavioural avoidance, having recurrent, unwanted distressing memories of the cyclone, trying to avoid things or talking about the cyclone. These symptoms are paralleled with the DSM-5 criteria for depression and Post-Traumatic Stress Disorder (PTSD), although traumatic stress reactions are often described as closely linked to anxiety. In addition to that prolonged grief due to loss of loved ones, property and livestock.

Depression and its related symptoms were confirmed by adolescents survivors of Cyclone Idai. Reviews concerning adolescence affected by natural disasters report that depression prevalence rates range from 7.5 to 44.8 percent across studies [20]. Among a sample of adolescents who lived through the 2011 Tornado outbreak in Alabama and Missouri, 7.5 percent met the diagnostic criteria for major depressive episodes following the disaster [21]. In a study conducted after six months after an earthquake in China, 24.5 percent of adolescents reported clinically significant depressive symptoms [21]. A similar rate of depressive symptoms was observed after a wildfire in Greece, and a somewhat lower rate of 17.6 percent was reported after a cyclone in India [22]. Furthermore, exposure to Hurricane Georges was associated with meeting diagnostic criteria for several different depressive disorders, with 4.1 percent of adolescents reporting major depression and 1.1 percent reporting dysthymic disorder, which is characterized by mood disturbance over a duration of more than 1 year in children as well as transient periods of normal mood [23]. Hence exposure to natural disasters can put adolescents at risk of developing depressive tendencies.

Signs of PTSD were also noted in adolescent survivors of Cyclone Idai. Research conducted in schools following bushfires in Australia found that students had elevated levels of PTSD, similar to those of global rates among adolescents who had experienced natural disasters worldwide [28]. In a sample of adolescents who lived through the 2011 Tornado outbreak in Alabama and Missouri, about 6.7 percent met the diagnostic criteria for PTSD following the disaster [21]. In a sample of 905 adolescents exposed to Hurricane Georges in 1998, 1.1 percent reported PTSD [23]. adolescents diagnosed with post-disaster PTSD often experience a decrease in quality of life, which may correlate with negative behaviours in school, including difficulty concentrating, disruptive behaviour, and poorer grades [28]. In this regard, PTSD has proven to be another mental health condition common in adolescence survivors of natural disasters.

In addition to depression and PTSD, signs of anxiety were also observed in adolescents survivors of Cyclone Idai. De Jong et al., [30], mentioned that exposure to disasters may lead to the development of anxiety disorders such as separation anxiety, panic disorder, and specific phobias. In a study conducted after Hurricane Georges in the Caribbean and Mexico, about 6 percent of adolescents ages 11–17 met the symptom criteria for separation anxiety, 3.2 percent for social phobia, 1.1 percent for panic disorder, and nearly 2 percent for generalized anxiety disorder [23]. Six months after an earthquake in China, 40.5 percent of adolescents had reported clinically significant anxiety symptoms; a similar rate of anxiety symptoms was observed after a wildfire in Greece, and somewhat lower rates of anxiety symptoms of 12 percent were reported after a cyclone in India [31].

The findings of this study have confirmed the assumptions of Bronfenbrenner's Social Ecological model which states that an individual is surrounded by multiple systems which should be properly functioning for the well-being of an individual. The

model is linked to Kurt Lewin's emphasis that there must be a person-environment fit for a person to be fully functioning. Thus, in this context, the cyclone disturbed the vital systems required for mental wellness of an individual. The disturbances have thus manifested in unfavourable changes in the adolescents' emotional and cognitive expressions.

Conclusions

There are various challenges that are being faced by adolescents in modern Zimbabwe and the world at large. The common challenge facing adolescence of the day is mainly climate change and its associated disasters as portrayed by the discussion above. Exposure to natural disasters has been found to expose adolescents to the risk of developing mental health conditions. Some of the conditions were exacerbated by lack of disaster preparedness at individual, family and community, societal and national levels. It was also noted that adolescent-survivors of Cyclone Idai lacked valid knowledge concerning climate change. As a result of exposure to the cyclone, the study confirmed that the most common mental health conditions exhibited by adolescent survivors include depression, PTSD, anxiety and suicide or suicide ideation. Prolonged grief was also noticed, not only in relation to the death of loved ones, but also due to losses of property, livestock and crops, which were the main sources of income for adolescence in Chimanimani.

Implications for policy

Basing on the findings of this study, the researchers suggested that the government has a great role to play in responding to natural disasters. The following recommendations have been passed:

- The Government of Zimbabwe should set up social and child protection systems that are sensitive to disaster situations to take care of children and adolescent. Procedures can include provision of psychological support, easy replacement of academic and identity documents lost in disaster, provision of food and shelter, extending education and health assistance.
- The Government of Zimbabwe should consider relocation of people who have been displaced by the disaster or who live in risk prone areas. Relocation means not adolescent only will be safe in the event of cyclones and floods but the whole community at large.
- Key agencies of the State tasked with disaster risk management such as the department of Civil Protection need adequate capacity and resources, including for research and core equipment to gather the knowledge necessary to understand and prepare for adolescence resilience in times of disasters.
- The Government of Zimbabwe should put aside a dedicated fund for adolescence disaster responses. It is only useful if it is viable, ring-fenced and transparently run. Similarly when support to disaster efforts is properly run, donors (local and international) are able to use more efficient and less hands on approaches to deliver assistance.
- The government's social services department must be allocated adequate funds to ensure that in times of disasters, adolescents have access to free counselling services and social and psychological support they require from trained professionals.
- The government should review its disaster preparedness strategies so that it will not be caught unprepared like was the case on Cyclone Idai.
- The adolescents themselves should be proactive in learning about climate change and how it can be dealt with.

Recommendations for future research

The research was based on a narrow Chimanimani case study; therefore, in future a broader quantitative scope could be useful in examining mental health conditions experienced by adolescents in response to climate change.

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