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OCCURRENCE OF NATURAL DISASTERS AND THEIR IMPACT ON MENTAL HEALTH

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ABSTRACT

Disaster is a sudden calamitous and unexpected event that brings great damage, loss and destruction to the community, at large. Disasters are caused by natural phenomenon as well as those created by humans. Any calamitous occurrence, generated by the effects of natural phenomena, that produces great loss to human life, destruction to natural environment, private property or public infrastructure, is referred to as natural disaster. In natural disasters, a natural hazard puts an impact on a population or area which results in severe damage, destruction and increased morbidity and mortality that overwhelms local coping capacity. Earthquakes, landslides, volcanic activity, hurricanes, tropical cyclones are prominent forms of natural disasters. Death, trauma and destruction of property on a large scale are the negative consequences of natural disasters. Thousands of people are killed and billions of habitat and

property is destroyed every year, due to such disasters. People who go through natural disasters, have a long lasting effect on their mental health. Post-traumatic stress symptoms are seen mostly in such communities. The community can take many years to repair and that repair period can lead to further vulnerability of different mental health issues. Generalized anxiety disorder, phobic reactions, major depressive disorder are commonly seen, and sometimes suicidal ideation and attempts are also observed. Though a psychological reaction increases the chance of survival among disaster victims, but long-term stress threatens mental health. A significant proportion of people may not be able to cope effectively with disasters and experience significant mental health problems. Normally, the emotional, attitudinal and behavioral reactions settle down within a week. If however, they remain protracted and intense, and if symptoms persist for a period of more than a month, then such situation leads to mental health issues. Thus, requiring adequate psychological support and mental health services becomes an issue of concern.

Keyword – Disaster, Morbidity, Trauma, Post-traumatic, Stress.

Disaster is any event that brings calamity on large scale, with negative outcome of death, trauma and destruction. A sudden and unexpected event that affects community at large, is referred to as disaster. Disasters are classified as natural and man-made, with man-made being intentional and non-intentional. Natural disasters occur in the form of earthquakes, hurricanes, tornadoes, tropical cyclones, floods, wildfire, and they threaten the lives of millions of people every year, across the globe. Human choices and activities, as, over population and over exploitation of resources, extreme urban sprawl and climate change, have a potential role in causing natural disasters. In 1976, the term natural disaster was called a misnomer due to human choices and activities playing a potential role in causing natural disasters. The rapid growth of population and its increased concentration often in hazardous environments, has accelerated both the frequency and severity of disasters. Extreme climates, unstable landforms, deforestation, unplanned growth proliferation and non-engineered constructions, create more vulnerable interface of populated areas with disaster-prone natural spaces. Natural disaster is linked to a natural hazard event. A natural hazard is a natural phenomenon that might have a negative impact on humans, and other animals or the environment. Natural hazard events are classified as geophysical and biological. (Burton, et. al, 1993) Natural hazards and natural disasters are not one and the same. Earthquake

is a natural hazard which can lead to earthquake disaster. A natural hazard is the threat of an event, whereas natural disaster is the actual occurrence of that event which has a significant negative impact on the community, at large. Natural hazards can be provoked or affected by anthropogenic processes as landuse change, drainage and construction. There are 18 natural hazards included in the National Risk Index of Federal Emergency Management Agency (FEMA, US). They are avalanche, coastal flooding, cold wave, drought, earthquake, hail, heat wave, tropical cyclone, ice storm, landslide, lightning, reverine flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, winter weather. In addition there are also dust storms seen.

A natural disaster may be caused by weather and climate events or by earthquakes, landslides and other occurrences that originate at Earth's surface or within the planet itself. Earth-driven natural disasters include large volcanic eruptions and strong earthquakes. A combination of several different forces also lead to natural disasters, as, landslides which is caused by heavy rains or are triggered by earthquakes. Snow on mountain slopes increases the risk of localized avalanches. Tsunamis, catastrophic ocean waves that can rise as high as 30 meters above normal sea level are produced by submarine earthquakes, underwater or coastal landslides or volcanic eruptions. The longest tsunamis are fast moving waves that can travel across oceans to wreak havoc in coastal areas separated thousands of kilometers from one another. No spot on earth is immune from a natural disaster, however certain types of disasters are often limited to or occur more frequently in specific geographic regions. In some regions, these events occur with seasonal regularity, as in the spring tornado season in the United States or the summer-and-fall hurricane season in the Atlantic Ocean, Caribbean Sea and the Gulf of Mexico. Earthquake and volcanic eruptions are most frequent near tectonic plate boundaries, and an especially active boundary exists between the Indo-Australian and Eurasian plates. World Meteorological Organization (WMO), a UN agency that monitors Earth's land, water and atmosphere-reported in 2021 that the number of natural disasters per decade showed a fivefold increase from 1979 to 2019. Though many natural disasters are neither preventable nor largely predictable, the WMO report notes that global warming is increasing the frequency of weather and climate related natural disasters, as, droughts, heat waves, increasingly intense hurricanes and flooding due to sea-level rise. Warmer temperatures are causing more extreme weather events by delivering

more precipitation to some areas – which may be unused to receiving heavy rains and snow, increasing the risk of flood, while delivering less precipitation to other areas that rely on it, increasing drought risk. Moreover, reliable sources of rainfall, such as the South Asian Monsoon, on which the agriculture of Indian sub continent depends, are becoming less predictable. The rain events have become more violent and dangerous, damaging crops and producing more intense flooding. This change has subjected some areas under the monsoon's influence to extended drought conditions, whereas other areas receive too much rainfall. Such pattern has increased in the 21st Century.

Natural disasters affect millions of people around the globe every year. The frequency of disasters and their impact on human beings has been increasing owing to climate change and growing population density. (Mc Farlane, et. al., 2012). In 2005, 162 million people were affected by disasters globally, and in 2010, this estimate increased to more than 330 million. (OFDA, 2006 ; 2010). Economic and social development is frequently interrupted by natural disasters (Kreimer, 2001) Developing countries are more prone to disasters because of various factors, like, poverty, lack of resources, lack of educational opportunities, poor infrastructure, lack of trained man power and lack of awareness (Math, et. al., 2006). An adverse event will not rise to the level of a disaster, if it occurs in the area without a vulnerable population (Alexander, 2002 ' Wisner, et. al., 2004). The death rate from natural disasters is highest in poorly developed countries due to the lower quality of building construction, infrastructure and medical facilities (Rosling, et. al., 2018). The Asia-Pacific region is the world's most disaster-prone region. India is one of the most disaster-prone areas of the world due to its location and geo-climatic conditions. About 58.7% of the total land mass is prone to earthquakes of moderate to very high intensity. About 68% of Indian land is vulnerable to drought, 12% of land is prone to floods, and 8% land is vulnerable to cyclones.

Since the 2004 Indian Ocean tsunami, India has become vulnerable to tsunamis. Landslides are becoming widely spread disasters in hilly terrain of India, including Himalayas. Between 1996-2001, 2.5% of national GDP loss in India occurred due to natural disasters and nearly 12% of government revenue was spent on relief, rehabilitation and reconstruction during the same period. The occurrence rate of natural disasters in India pose threat to the economic

development. A significant amount of waste is generated within a short period of time due to natural disasters. The tsunami in Japan in 2011 and typhoon in Hong Kong in 2018 were followed by tonnes of waste and micro-plastics. American Disaster Reduction Centre, analyzed the number of occurrences, deaths, people affected and economic losses from disaster events in the period 1992-2021. An increasing trend of disaster occurrence was observed globally. Annual average of disasters was 340. Earthquakes caused most of the death from at an average of 990 deaths per disaster. An annual average of 141 disasters was reported from 1992-2021, in Asia. The average number of affected persons was found to be 168.81 million. Climate related disasters, as flood, storm and drought have been increasing globally, particularly since the 1940s. From 1992 to 2021, an annual average of 16 droughts, 147 floods and 100 storms were reported globally.

Impact on Mental Health

Natural disasters are overwhelming and potentially traumatic life experiences. They are global complex issues, affecting communities at large. Losses, traumas and destruction faced by people during and after the disaster, can have long-losting impressions on human mind, affecting their mental health negatively. Facing the danger of death or physical injury and the loss of home, possessions and the loved ones can spark generalized anxiety, depression, post-traumatic stress, acute stress and adjustment disorders. Although, there are individual differences seen, in the reactions to traumatic events, a number of common reactions are observed. *Emotional reactions* (panic attacks, shock, fear, irritation, anger, sadness and guilt feeling); *Psychosomatic reactions* (sleep disturbances, eating problems, tense muscles headaches, palpitation, nausea, diarrhea or constipation, breathing difficulties), *Cognitive reactions* (repeated thoughts, involuntary trigger of memories, nightmares, confusion, flashbacks, difficulty in concentrating and decision making, memory problems) ; *Behavioral and Attitudinal reactions* (disruptions in social relationships, poor motivation, disruption in habits, lethargy, hopelessness, loss of interest). These are post-disaster reactions. Normally such reactions settle down within a week, but if these reactions persist for over a month or so, they may lead to different mental health problems. The first study done systematically on the mental effects of disaster was conducted in Zurich, after a mining disaster in 1906, and an earthquake disaster in Messina, Italy in 1908 (Stierlin; 1909, 1911). It

was found that survivors who ventilated their grief, showed a faster recovery. A study investigating 109 worst natural disasters occuring between 1960-1987, reported that developing countries suffered the most (Benz, 1989). Disasters tend to increase the prevalence of psychopathology, on an average by 17% as compared to pre- disaster groups (Ruboins & Bickman, 1991). 'Disaster syndrome' a term first coined by Tyhurst (1951), refers to the period right after the disaster, when exposed persons are 'dazed, stunned, unaware, frozen, or wandering aimlessly.' Such symptons affect upto 20%-25% of people who get exposed to disaster, and generally resolve with time. The mental health and behavioral consequences of natural disasters have ranged from mild to very severe (Galea, et.al., 2005). Numerous studies reveal that disasters involving exposure to the dead and dying, lingering social and community disruptions, and massive destruction, lead to severe and chronic psychological problems (Norris, et. al., 2004: Fukuda, et.al., 1999; Bland, et.al., 1996; Gleser, et.al., 1981). The prevalence of psychological and psychiatric morbidity among disaster survivors has been reported as long- term effects of disasters (Salcioglu, et.al, 2007). Some studies suggest that earthquake related psychological distress seem to be of permanent nature (Bland, et.al., 1996; Kato, et.al., 1996). Post- traumatic stress disorder (PTSD) has been found to be a common mental health impact of natural disasters, both in western countries (Acierno, et.al., 2007) and Asian countries (Kumaret, et. al, 2007; Lai, et.al, 2004; Wang, et.al, 2009). Talking about post- disaster prevalence of psychological disorders indicates that 25% to 75% of people exhibit mental health problems (Fredrick, 1981; Duffy, 1988). Psychological morbidity tends to affect 30 – 40% of the population within the first year of post- disaster period (Raphael, 1986). Approximately 40 -70% of the population is identified to be at risk of developing PTSD (Yule, et. al., 1999). It has also been observed that a significant portion of people exposed to traumatic events, go on to develop severe and prolonged psychological reactions. (Cantenbury & Yule, 1999).

India is vulnerable to natural disasters which leads to a significant loss in the affected population. The first well-documented research to see the mental health impact of disaster in India, was conducted on the survivors of a fire disaster (Narayanan et. al., 1987). It revealed that, not only mental disturbance related symptoms were seen but the families of the deceased showed a reduction in coping behaviour. The Bhopal gas tragedy (1984), Marathawada earthquake (1993),

Andhra Pradesh Super Cyclone (1996), Orissa Super Cyclone (1999) Gujrat earthquake (2001), Indian Ocean Tsunami (2004), are the six major disasters, faced by Indian population. Within three months of Bhopal gas disaster, a 22.6% of prevalence rate for mental disorders was reported. Anxiety neurosis (25%), depression (20%), adjustment reaction with predominant emotional disturbance (16%) was reported. Females (81.1%) and middle adulthood persons (74%) mostly expressed such symptoms. (Srinivasa Murthy & Isaac, 1987). The post-disaster period for other disasters also showed an increased psychiatric morbidity. Some studies have reported, people's needs and feelings of vulnerability, as important mental health indicators of people affected by disasters. Other studies focused on the extent of poverty, homelessness and violence, thus, indicating the risk of mental health among people living in disaster affected areas (Lohokare and Davar, et. al., 2000). Numerous studies indicate that disasters might have a significant negative impact on the mental health of population affected. The individuals and communities facing disaster, experience mental instability which might precipitate post-traumatic stress, anxiety and depression among them.

Generally, the damage due to disasters is measured in terms of social and economic losses, but least concern is given to the person who suffers emotionally in post-disaster period. Psychological distress is commonly experienced by disaster victims. Disasters are mostly unpredictable, so they leave victims in a state of shock. Mostly the victims tend to use denial, of reality as mental mechanism. Being in the state of denial makes the victims of disaster more vulnerable to stress, anxiety and other maladaptive reactions. When the shocking situations induced by disaster damage their home, properties and other valuable assets, it leads to feeling of insecurity in the victims. Death of a dear one also leads to the feeling of insecurity because of the deprivation of the sense of love, attachment and belongingness. Various factors lead to the psychological vulnerability of the victims, as, displacement of the family, death of loved ones, socio-economic loss, environmental loss, lack of preparedness for the disaster, disruption of family bonds, lack of social support and negative coping skills. (Peek, 2008). The mental effects of disaster are more drastic among children, women and dependent elderly population, making them the most vulnerable ones. They have special needs, which needs utmost attention and care. There are various behavioural, psychological and emotional issues and instabilities observed in

older children and adolescents in post-disaster period. Mostly post-traumatic stress, depression, anxiety, emotional distress and sleep disorders are reported among them. (Peek, 2008).

Disasters may put the victims in a state of despair and shock. The fully-functioning life of victims gets disrupted and they feel like losing their identity. Also, lack of hope, loss of resources and social support, lack of control over their lives, all lead to elevated levels of psychological distress. Severe stress, feelings of grief and sadness for a prolonged period of time, substance abuse, adjustment problems, family conflicts are some symptoms noteworthy. Jenkins and Meltzer (2012) studied mental health impacts of Indian Ocean tsunami, 2004. The survivors showed a wide range of symptoms related to anxiety, depression and post-traumatic stress. The displaced victims, however, reported such symptoms to a great extent as compared to the non displaced victims. Unnecessary fear and adjustment problems were commonly observed. The victims expressed the feelings of hopelessness and a constant state of despair. The mental impacts of flood were seen mostly in the form of anxiety on seeing the rainfall (Tapsell, et. al., 2002).

Disaster Risk Management

Natural disasters are an inevitable truth of our lives. The general effects of natural disasters are loss of life and livelihood, injury, damage to and destruction of property and production, disruption of lifestyle and essential services, as well as governmental systems, damage to national infrastructure, and national economic loss. Last but not the least to say, disasters carry a heavy burden of sociological and psychological after effects. Hence, disaster risk management becomes an essential part of life. As per sec. 2(e) of DM Act-2005, Disaster management means a coordinated and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for –

i. Prevention of danger or threat of any disaster.

ii. Mitigation or reduction of risk of any disaster or its severity or its consequences.

iii. Capacity building.

iv. Preparedness to deal with any disaster.

v. Prompt response to any threatening disaster situation or disaster.

vi. Assessing the severity or magnitude of effects of any disaster.

vii. Evacuation, rescue and relief.

viii. Rehabilitation and reconstruction.

Prevention, refers to impede the occurrence of a disaster event and/or prevent such an occurrence having harmful effects on communities or key installations. *Mitigation*, works through the specific programs intended to reduce the effects of disaster on a nation or community. *Preparedness* is usually regarded as comprising measures which enable governments, organizations, communities and individuals to respond rapidly and effectively to disaster situations. Examples of preparedness measures are-the formulation and maintenance of valid, up-do-date counter-disaster plans ; special provisions for emergency action ; the provisions of warning systems ; emergency communications ; public education and awareness ; training programs, including exercises and tests. The *principles* of disaster management are risk and hazard management, planning, organization, resource utilization, need for specialists and training.

The National Disaster Management Authority (NDMA), under the chairmanship of the Prime Minister is the apex body responsible for laying down policies, plans and guidelines for disaster management, and for coordinating their enforcement and implementation throughout the country. National Disaster Response Force (NDRF), works under the supervision of NDMA, which is the specialized force for disaster response. State Disaster Management Authority (SDMA), headed by Chief Minister, lays down the policies and plans for disaster management in the State. District Disaster Management Authority (DDMA), headed by District Magistrate, is the planning, co-ordinating and implementing body for disaster management at district level. DDMA also ensures that the guidelines laid by the NDMA and the SDMA are followed by all departments of the State Government at the district level and the local authorities in the district.

Mental Health Support For Disaster Survivors

As part of the comprehensive disaster framework of the country, the national guidelines on Psychosocial Support and Mental Health Services (PSSMHS) in disasters were released in 2009. Psychosocial support in the context of disasters are comprehensive intervention programmes, aimed at addressing a wide range of psychosocial and mental health problems as outcomes of disasters. This support comprises of general intervention related to the larger issues of promoting or protecting psychosocial well-being of individuals. Relief works, meeting the emotional needs of persons, restoring of social relationships, enhancing coping capacities and promoting harmony among the survivors, lead to psychosocial well-being. Mental health services in disaster interventions focus on the identification and management of stress-related mental symptoms among disaster-affected persons and persons with pre-existing mental health problems.

In India, the mental health issues caused by disasters, remains a neglected area because here mental problem is considered to be a stigma. Disasters have a significant impact on the socio-economic and mental state of victims. Acceptance of the situation, is an effective coping skill which helps the victims to practically visualize the situation and adopt effective measures to develop patience and resiliency in them. Resilience is the capacity to withstand or to recover quickly from difficulties. It is not just the ability to deal effectively with negative situations and instantly recover from the negative impacts, but it is also mental preparedness for future situation and vulnerabilities. It helps a lot to the victims to adapt to the change they experience post-disaster. Intervention strategies help victims in normalizing their mental health, despite their losses. Preparing oneself for the stressors, accepting the stressors and finding the means to overcome the sufferings, is one of the best coping mechanisms. It has been observed that, understanding the significance of one's own existence and nurturing one's own self, help the survivors to enhance the quality of their well- being. Psychoeducation is helpful in learning of the virtues and personal capabilities that an individual possesses, which is a successful psychological intervention. A genuine support received from the loved ones, neighbours, friends and other people willing to counsel the affected individuals and communities, give good results. Relaxation techniques help individuals to balance and regulate their mind and body. Individual based intervention techniques, help victims to overcome the trauma as soon as possible. The

victims regain hope and emotional control on themselves and inculcate environment adaptability, which improves their mental health.

Conclusion

Disaster is an event that occurs suddenly and unexpectedly, causing severe disturbances, resulting in loss of life, property and health of population. Such a situation causes disruption in normal pattern of life, generating misfortune, helplessness and suffering, affecting the socio-economic structure of a region/ country to such an extent that there is a need for assistance or immediate outside intervention. Hence disaster management is required which rests on prevention, mitigation, preparedness, prompt response, assessing the severity or magnitude, evacuation rescue and relief, rehabilitation and reconstruction. Areas of concern may be, sustainability of efforts, funding, standardized efforts in compiling and interpreting geo-spatial data, satellite imagery and early warning signals, effective disaster management by integrating the scientific, technological and administrative agencies.

The impact of any disaster on the mental health of the survivors is enormous which needs a quick attention. Emotional instability, stress reactions, anxiety, post- trauma reactions are commonly observed after the disaster. These psychological effects have a massive impact on individuals and communities. Resilience plays a vital role and is useful in protecting the mental health. Most individuals recover with time, with the help of their individual strengths and effective post-intervention technique. In some cases recovery is incomplete which leads to numerous persistent psychotic symptoms which are often serious in nature, PTSD along with anxiety, depression and other behavioral and psychological abnormalities are reported. Unnecessary fear, hopelessness, worthlessness, helplessness and physical symptoms, lead to the deterioration of mental health.

Disasters create a significant burden of mental health conditions on individuals and community, at large. Effective interventions are useful in improving the adverse mental health effects of disaster. The psycho- social education and clinical intervention are expected to give better results. Keeping in mind the cultural context of the community and needs of the affected

population, rehabilitation plans can be made, so that the community is empowered in a holistic way to face the future disasters.

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