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Tsunami in Kerala, India: Long-Term Psychological Distress, Sense of Coherence, Social Support, and Coping in a Non-Industrialized Setting

1 Introduction: Tsunami in Kerala

On December 24, 2004, an earthquake measuring 9.1 on the Richter scale occurred off the west coast of Northern Sumatra causing one of the most devastating tsunami waves ever recorded. It was the largest earthquake in the world since 1964. At least 231,000 people lost their lives and 1.7 million were rendered homeless (U.S. Geological Survey, USGS, 2008). Many people barely survived by running for their lives or by climbing onto rooftops (Schnibben, 2005). The under sea earthquake was caused by the Indian tectonic plate sliding under the Burma tectonic plate. The resulting ocean swells traveled as a wave 2,000 kilometers across the Indian Ocean. In this way, the tsunami waves caused destruction along the coastlines of 14 different countries, including Indonesia, Sri Lanka, Thailand, India, and even Africa (USGS, 2008).

India was the third country severely affected by the tsunami after Indonesia and Sri Lanka. The states affected were Tamil Nadu, Pondicherry, Andhra Pradesh, Kerala, and Andaman and Nicobar Islands. When the tsunami struck India's coastline at 8:45AM local time on December 26, 2004, the southeastern coast of Tamil Nadu and Andaman and Nicobar Islands were the worst hit areas (Arya, 2005).

The death toll in India was approximately 15,000 (Arya, 2005), or even higher than 16,000 with 10,749 dead and 5,640 missing on February 2, 2005 according to Mohanty (2005). Most of the Indians reported missing were from the Andaman and Nicobar Islands, so the death toll might actually be much higher. Immediately after the tsunami hit the Indian coastline, 730,000 individuals were forced to leave their homes. A total of 157,393 dwelling units were destroyed, without taking into account Andaman and Nicobar Islands (Government of India, Ministry of Home Affairs, 2005). Thus, even though some people were able to return to their houses, more than 400,000 people lost their homes (Tsunami Response Watch, 2005). One million people were altogether affected by the tsunami in India (International Federation of Red Cross and Red Crescent Societies, 2005), or even 1.3 million according to the Government of India, Ministry of Home Affairs (2005). In India, seventy-five percent of the people affected were women and children. A total of 83,788 boats were damaged or destroyed in India alone, thus depriving countless people of their source of livelihood (Government of India, Ministry of Home Affairs, 2005). The reconstruction costs were estimated to be more than 1.2 billion US dollars (The World Bank, 2005).

Table 1 shows the average scenario of tsunami devastation in the respective Indian states. Data relating to the Andaman and Nicobar areas are yet to be assessed, which is why they do not appear in the table (Mohanty, 2005; Govern-

ment of India, Ministry of Home Affairs, 2005; World Health Organization, 2005).

Table 1

Tsunami Damage in India

Factor	Andhra Pradesh	Kerala	Tamil Nadu	Pondicherry	Total
Population affected	211,000	355,000	691,000	43,000	1,300,000
Area affected (Ha)	790	Unknown	2,487	790	> 4,067
Length of coast affected (Km)	985	250	1,000	25	2,260
Extent of penetration (Km)	0.5 - 2.0	1 - 2	1 - 1.5	0.30 - 3.0	
Reported height of tsunami (m)	5	3-5	7-10	10	
Villages affected	301	187	362	26	876
Dwelling units lost	1,557	11,832	91,037	6,403	110,829

In Kerala, the water level rose so dramatically that many houses were swept away or crumbled with the massive flooding. Many people lost their family members. In addition, many boats and fishing nets were destroyed and thus their means of earning a livelihood. Consequently, we can assume that the people being hit by the tsunami in the fishing villages of Kerala were traumatized by this natural disaster.

Kerala lost an estimated 200 people. On December 28, 2004, the death toll was already estimated at 156. The people most affected by the tsunami were the local fishermen. Eighty percent of the people affected by the tsunami came from fishing communities. Hundreds of fishermen lost their boats and other

fishing equipment in the disaster. Moreover, the fishermen from Kerala experienced further problems, as the price of fish dropped by 30 percent in the weeks following the tsunami. People were afraid to eat fish because they thought the fish had been feeding on the dead bodies in the water (unpublished report by the students of Amrita Vishwa Vidyapeetham, Amritapuri, Kollam).

In Kerala, the Kollam district was the worst hit area with 131 casualties (Effect of 26 December 2004 Tsunami in Kerala Coast, 2005). According to the records of the Taluk Office in Karunagapally, Kollam District, Alappad Panchayat in the Kollam district was affected the most with 130 of the deaths and Azheekal being the worst affected village. A total of 1,443 people suffered from minor, and two from major injuries, and 2,909 houses were destroyed (August, 2007). A total of 450 people reported the loss of a family member and 1,500 lost their means of livelihood. Other districts in Kerala that were affected by the tsunami include Alapuzha, Ernakulam, Kannur, and Kozhikode (Report by the Taluk Office in Karunagapally, Kollam District).

The 2004 tsunami is just one example of a natural disaster. According to Linneweber and Lantermann (2006), natural disasters are taking place more and more frequently and causing increasing damage every year. During the past decade, the number of natural and technological disasters has dramatically risen. From 1994 to 1998, the number of reported disasters was on average 428 per year, but from 1999 to 2003 this has figure drastically increased by two-thirds to an average of 707 disasters annually. The greatest increase occurred in countries with low socio-economic power, where it has increased by 142 per cent. Both hydro-meteorological and geophysical disasters have become more common, becoming 68 and 62 percent more frequent, respectively, over the decade. Among natural disasters, floods are the most reported events in Africa, Asia, and Europe, while windstorms are most frequent in the Americas and Oceania. The reason why more and more people are being affected by disasters is due to a combination of factors: the rising number of disasters, drastic population increase in poorer parts of the world, and rapid and unplanned development, particularly in urban areas (International Federation of Red Cross and Red Crescent Societies, 2004). In a review paper on natural disasters in Asia, Kokai, Fujii, Shinfuku, and Edwards (2004) reported that of approximately the 3 billion people worldwide affected by disasters from 1967 to 1991, around 85 percent lived in Asia.

Numerous definitions of “disaster” can be found in the literature, such as the following:

A disaster situation is the result of the interaction between a physical event (or a combination of several events) and communities or groups of people vulnerable to

it, who do not have the resources to cope with the situation that ensues.” (Revel, 1996, p.289).

According to Smith (1983, p.123), disasters are defined as “calamitous events, especially those occurring suddenly and causing great damage to property and hardships for human beings”.

Such tragic events lead to a feeling of helplessness, being overwhelmed by uncontrollable events, and also to a shattering of basic assumptions about life. The victims of disasters experience a loss of personal security and the ability to predict the future. They see themselves as less capable of withstanding stressful situations. Moreover, the psychological reaction of most individuals after the disaster can be described as a reaction to extreme stress (Herzog, 2004). The oscillation between avoidance and intrusive memories of the event is described by Horowitz (1997) as a “stress response reaction”. As people search for the meaning of such events, they often view them as “acts of God”, punishing a community for misbehavior (Revel, 1996).

After a disaster has struck a community, it is not sufficient to provide the most essential physical needs, such as food, water, sanitation, shelter, and medical assistance. Relief organizations also need to establish psychological support, as well, as part of a rehabilitation project. The victims need to know that someone strong is in command and that they are now safe. At the same time, they need to be allowed to tell their story, as this enables them to express their distress. When survivors of natural disasters return to their homes, they need to readapt to their daily lives and they may develop new symptoms such as sleeping problems and poor concentration. Some people might even isolate themselves from former social contacts. Therefore, outreach programs for survivors should remain available for some time after the disaster (Revel, 1996).

Furthermore, as resources are scarce, external support is crucial in the aftermath of a disaster. Non-government organizations (NGOs) are the primary source for these extra resources. Their strength lies in their commitment, number of volunteers, sociocultural integration, and timely availability. Volunteers can attend to survivors and their families, listen to them, and respond to their questions and their needs. This reduces their acute level of stress and restores their self-confidence. NGOs also take care of the long-term-rehabilitation, which can take months or even years. They help the survivors establish a somewhat “normal” life and facilitate the communication between victims (Revel, 1996).

Since the Indian Government rejected help from foreign countries, it and Indian NGOs assumed the task of providing relief aid (Letukas & Barnshaw, 2008). One NGO, which provided immediate aid in the region where this study was conducted, is the Mata Amritanandamayi Math (MAM). In 2005, the Unit-

ed Nations conferred “Special Consultative Status” upon the organization with the UN Economic and Social Council. Starting immediately after the waves had struck the coastline of Kerala, where the headquarters of the MAM are situated, the MAM volunteers had started a massive tsunami relief and rehabilitation project. By September 2007, the MAM had constructed 4,500 tsunami-relief houses throughout India and Sri Lanka; distributed 700 fishing boats, boat engines and fishing nets; supplied food, clothing and medical care to hundreds of thousands; provided long term psychological counseling and wellness camps for children; established relief camps; built an escape bridge; and economically strengthened entire villages through the organization of cottage-industry cooperatives, education, and job training (Mata Amritanandamayi Math, 2007).

However, in spite of these massive relief efforts, the villagers had experienced a devastating traumatic event and the question arises, to what extent the people living along the coastline of India are still traumatized two and a half years after the tsunami. Immediately after the disaster, Western research on the consequences of the tsunami only focused on the psychological effects it had on tourists, their relatives and volunteers from abroad. Bronisch (2005) and Bronisch, Maragkos, Freyer, Müller-Cyran, Butollo, Weimbs, and Platiel (2006), for example, reported that German disaster management teams in Phuket and Kao Lak found German tourists with the following symptoms: dissociation, increased arousal, flashbacks, sleeping disorders, illusions, loss of appetite, grief reactions and suicidal ideation. In an article about her own activities as a helper, Zimmermann (2005) describes the great suffering that Swiss tourists in tsunami-affected areas had undergone. Even those German citizens who were not themselves present in the tsunami affected areas, but watched the events regularly on television, showed symptoms of anxiety and stress such as sleeping disorders and flashbacks (Knieper, 2006). But to what extent are the local people in the tsunami-affected areas traumatized?

As a matter of fact, extensive research has been done on long-term effects of natural disasters, however, most of the studies have been conducted in the Western hemisphere. Not many investigations have focused on answering the question to what extent the results of those studies are applicable in Non-Western cultures and can provide guidelines for effective relief aid and rehabilitation. Only few studies were conducted investigating the psychological sequelae of the tsunami, for example, Kumar, Murhekar, Hutin, Subramanian, Ramachandran, and Gupte, (2007) investigated the effects of the tsunami in Tamil Nadu. Therefore, the author wanted to explore the psychological consequences of the 2004 tsunami in South India.

The present study was conducted in certain fishing villages along the coastline of Kerala. This setting was chosen for several reasons: The population in

Kerala has the highest literacy rate in India, thus the participants were able to complete the questionnaires without difficulty. Along the coastline of Kerala, the author chose the worst hit areas and an area not affected by the tsunami that was nevertheless in close physical proximity to the affected area. Moreover, the participants had received some form of relief aid from the MAM and were thus willing to participate in the study. The majority of the villagers in the affected group, for example, had received new houses. In the not affected group, participants formed self-help-groups to start micro-businesses. Since the author is a member of the NGO MAM, she had the possibility to work together with leaders of the self-help-groups, and other villagers who supported her research by, for example, providing translators.

Taking into consideration cross-cultural aspects, a contribution shall be thus be made to exploring the long-term consequences of natural disasters. Why do some people suffer from PTSD, whereas others do not? Are certain protective factors also effective in non-Western countries? How do people cope with devastating flood disasters? What impact does the severity of the trauma, i.e. loss of one or more family members, destruction of one's house, or loss of ways to earn a livelihood, make on the level of impairment? Once it is known which protective factors mitigate the traumatizing effects of natural disasters, this information could influence future long-term rehabilitation projects for disaster victims.

2 Description of Post-Traumatic Stress Disorder (PTSD)

When a life-threatening event occurs, it is normal to react with distress, anxiety, and fear. This reaction enables people to survive and these emotions enhance the memory of the traumatic event, so that they can recognize and avoid similar situations in the future. For some individuals, however, this natural reaction to a traumatic situation becomes uncontrollable and exaggerated, and they develop symptoms of PTSD. The nature and severity of the trauma as well as personal characteristics determine the severity and duration of the symptoms (Breslau, 2001b).

When one's life is in danger, one reacts to this situation of extreme stress by, for example, denying what has happened or giving the impression of losing contact with reality. Many people cannot quickly integrate what has happened and refuse to accept reality. They may feel numb and focus on insignificant details. Others feel guilty and in some way responsible for the tragedy. Fear of the reoccurrence of the event is also common. These are normal reactions to abnormal situations that help people survive (Revel, 1996).

2.1 Historical Development of the PTSD Construct

Psychiatrists' and psychologists' understanding of PTSD has undergone a series of changes throughout the last 150 years. The diverse social, biological, and psychological processes associated with it were initially believed to have only physical causes.

In 1866, the term "railway spine" was first used to indicate a symptom group associated with events such as railway collisions, producing shock, fright and emotional disturbance. The opinion of the majority was that the jolts and shakes experienced on these occasions were sufficient to cause neurological damage. The novelty about this syndrome was that no significant external injury could be seen (Young, 2000).

A few years later in 1871, the phenomenon of soldiers being affected by the events of the American Civil War was described in the scientific literature as "Da Costa syndrome", "irritable heart" (Da Costa, 1871), "effort-syndrome", or "neurocirculatory asthenia". These terms refer mainly to the physical symptoms that the soldiers developed as a reaction to the psychological traumatization of the Civil War.

In the late 19th century, terms such as "hysteria" and "traumatic neuroses" were common in Europe. A "traumatic neurosis" was said to be a mental disorder caused by a physical as well as psychological trauma such as an illness or

the like (Berger & Van Calter, 2004). Freud differentiated a traumatic neurosis from anxiety and depressive neuroses and postulated that the term “traumatic” refers to an experience that within a short period of time presents the mind with an increase in stimulus too powerful to deal with in a normal manner. During the First World War, the traumatized soldiers were supposedly afflicted by “shell-shock”, resulting from microhemorrhages caused by the explosion of shells, or others believed that they simply refused to return to the war front due to their lack of courage. Consequently, they were considered as “moral invalids” and treated with disciplinary therapy, which involved severe electric shocks or other methods to inflict pain. This view and these treatment methods continued into the Second World War (McFarlane, 2000).

Survivors of the Holocaust and concentration camps of the Nazi-regime suffered from the alleged “survivor syndrome”, which manifested in symptoms such as psycho-physiological exhaustibility, as well as depressive and anxious symptoms that are still visible in the victims today (Berger & Van Calter, 2004).

Finally, in 1980, it was recognized that survivors of traumatic events generally endure specific and painful psychological consequences of the event. The term “post-traumatic stress disorder” was introduced in the DSM-III (American Psychiatric Association, 1980), as the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM). This term carried over into the DSM-III-R (American Psychiatric Association, 1987) and the DSM-IV (American Psychiatric Association, 1994), and can be found in the chapter for anxiety disorders (Berger & Van Calter, 2004). In the International Classification of Diseases (ICD-10), the PTSD is not a subgroup of the anxiety disorders but of the category F4, “Neurotic, Stress and Somatoform Disorders”. The anxiety disorders are also a subgroup of this category (World Health Organization, 1992).

2.2 Definition of Trauma

A traumatic event that is defined as a “trauma” and that precedes PTSD, is described by the World Health Organization (WHO) (1992) as:

A stressful event or situation (either short- or long-lasting) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost everyone (e.g. natural- or man-made disaster, combat, serious accident, witnessing the violent death of others, or being the victim of torture, terrorism, rape, or other crime) (World Health Organization, 1992, p.147).

In 1987, the American Psychiatric Association defined a traumatic event as one “that is outside the range of usual human experience and that would be markedly distressing to almost anyone” (p.250). However, in the most recent Diagnos-