PREVALENCE OF PSYCHOLOGICAL DISTRESS AND ITS ASSOCIATED FACTORS AMONG MEDICAL RELIEF WORKERS INVOLVED IN THE 2014 FLOOD DISASTER IN KUALA KRAI KELANTAN

DR. PUNITHA

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF MEDICINE

(PSYCHIATRY)

UNIVERSITI SAINS MALAYSIA

2017

DECLARATION

I hereby declare that the work produced in this thesis is of my own effort except quotations and summaries, which have been duly acknowledged.

DR PUNITHA A/P UDAYA KUMAR

PUM 0398/11

CERTIFICATION

This is to certify to the best of my knowledge, this research project is the original work of Dr. Punitha A/P Udaya Kumar (PUM0398/11).

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Supervisor:

Dr. Mohd Azhar Mohd Yasin

Psychiatrist and Lecturer,

Department of Psychiatry,

School of Medical Sciences,

Health Campus, Universiti Sains Malaysia.

ACKNOWLEDGEMENT

I am grateful to GOD for giving me the strength to complete the daunting and challenging task of completing my thesis, and Without HIM, I would not have been able to come this far. I would also like to express my deepest gratitude to Prof.Dr.Asrene binti Razak, Head of Department of Psychiatry USM for being an amazing mentor and for encouraging me during my struggle. Her persistence in having faith in her students made us all the more determined to finish this journey despite the tough times.

I am also indebted to my supervisor, Dr. Mohd Azhar Mohd Yasin Senior Lecturer and Psychiatrist at Department of Psychiatry, School of Medical Sciences, Health Campus, Universiti Sains Malaysia for his endless support, comments and guidance. My sincere appreciation to Dr.Kueh, who guided me in my statistical analysis and without her I would not have been able to complete my work.

Special thanks to all those who have helped me in my thesis work, especially the Chief Matron, the Pengarah of Hospital Kuala Krai and all the participants of this study . Last but not the least, my deepest gratitude and love for my parents who have been my rock throughout the Master's Program and never faltered in their support for me.

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LIST OF ABBREVIATIONS

<	:	Less than
≥	:	Equal to and more than
=	:	Equal to
%	:	Percentage
α	:	Alpha
n	:	Sample size
N	:	Population size
Z	:	Z statistic
P	:	Expected proportion
d	:	Precision
PTSD	:	Post-Traumatic Stress Disorder
IES-R	:	Impact Event Scale-Revised
DASS-21	:	Depression, Anxiety and Stress Scale
PFA	:	Psychological First Aid

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ABSTRACT

This study aims to determine the prevalence of psychological distress and its associated factors among medical relief workers who provided service in Hospital Kuala Krai, Kelantan during the 2014 major flood disaster. It is a cross sectional observational study conducted among 160 medical relief workers 8 months after the disaster occurred. Socio-demographic data was collected using a Proforma, while PTSD, Depression, Anxiety and Stress were assessed using the Impact Event Scale-Revised and DASS-21 respectively. Coping methods were assessed using the Brief COPE questionnaire. All the scales used were in Malay version and self-reported.

The prevalence of PTSD was 12.5%, Depression 18.1%, Anxiety 38.8% and 18.1%. Using multiple logistic regression analysis, education (ORadj 0.04, 95% CI 0.00-0.50, p = 0.013) and experience of traumatic event (3.86, 95% CI 1.11-13.41, p=0.034) were found to be significantly associated with PTSD. For depression, total household income per month (ORadj 0.99, 95% CI 0.998-0.99, p=0.002), number of hours per day of relief work (ORadj 0.90, 95% CI 0.81-0.99, p=0.032), and use of Emotional Support (ORadj 2.58, 95% CI 1.13-5.88, p=0.024) were found to be significant.

Previous flood experience (ORadj 0.20, 95% CI 0.06-0.65, p=0.08), number of hours per day of relief work (ORadj 0.92, 95% CI 0.86-0.98, p=0.011) and use of Emotional support (ORadj 2.14, 95% CI 1.30-3.52, p=0.003) were found to be significant for Anxiety. Finally, occupation (ORadj 0.25 95% CI 0.09-1.69, p=0.007) use of Behavioral Disengagement (ORadj 1.61, 95% CI 1.06-2.45, p=0.025) and Self-blame (ORadj 2.31, 95% CI 1.48-3.88,p=0.002) were found to be significantly associated with Stress. In conclusion, medical relief workers were vulnerable to

psychological distress and had increased prevalence of PTSD, Depression, Anxiety and Stress.

ABSTRAK

Kajian ini bertujuan menentukan kadar tekanan psikologi dan factor-faktor berkaitan di kalangan pekerja bantuan kesihatan yang bertugas sewaktu banjir di Hospital Kuala Krai, Kelantan pada tahun 2014. Kajian ini menggunakan kaedah hiris lintang dan di laksanakan di kalangan 160 kakitangan kesihatan Hospital Kuala Krai yang bertugas sebagai pekerja bantuan sewaktu banjir. Maklumat sosio-demografi di ambil dengan menggunakan Profroma, manakala PTSD, Kemurungan, Kerunsingan dan Tekanan di kaji menggunakan Impact Event Scale-Revised dan DASS-2. Coping(Kaedah menangani masalah) di kaji menggunakan borang soal-selidik Brief COPE. Kesemua borang soal selidik adalah dalam Bahasa Melayu dan di jawab oleh peserta sendiri.

Kadar PTSD di kalangan perserta adalah 12.5%, Kemurungan 18.1%, Kerunsingan 38.8% dan Tekanan 18.1%. Dengan kaedah analisa regresi logistic, didapati tahap pendidikan (ORadj 0.04, 95% CI 0.00-0.50, p = 0.013) dan pengalaman kejadian trauma (3.86, 95% CI 1.11-13.41,p=0.034) berkait rapat dengan PTSD. Untuk Kemurungan pula, pendapatan bulanan (ORadj 0.99, 95% CI 0.998-0.99, p=0.002), jumlah jam bekerja dalam sehari (ORadj 0.90, 95% CI 0.81-0.99, p=0.032), dan menggunakan Sokongan Emosi (ORadj 2.58, 95% CI 1.13-5.88, p=0.024) didapati berkait rapat.

Bagi Kerunsingan, factor yang mempunyai kaitan yang signifikan adalah pengalaman terlibat dengan banjir (ORadj 0.20, 95% CI 0.06-0.65, p=0.08), jumlah jam bekerja dalam sehari (ORadj 0.92, 95% CI 0.86-0.98, p=0.011) dan menggunakan Sokongan Emosi (ORadj 2.14, 95% CI 1.30-3.52, p=0.003). Akhir sekali, jenis pekerjaan (ORadj 0.25 95% CI 0.09-1.69, p=0.007), kaedah

Pengunduran Tingkah Laku (ORadj 1.61, 95% CI 1.06-2.45, p=0.025) dan Menyalahkan diri (ORadj 2.31, 95% CI 1.48-3.88,p=0.002) berkait rapat secara ketara dengan Stress. Kesimpulannya, kadar tekanan psikologi dikalangan pekerja bantuan perubatan adalah tinggi.

CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

1.1.1 General Overview

Natural disasters are unexpected ecological or geomorphic events that cause massive destruction and loss of lives. These disasters are categorized into endogenous (such as volcanism and earthquakes) and exogenous, which include floods, tsunamis, coastal erosion, avalanches and hurricanes (Slaymaker, 1996). In the past 30 years, more than 6000 natural disasters worldwide have claimed at least 2 million lives and caused over 180 million people to lose their homes (Guha-Sapir, Hargitt and Hoyois, 2004).

The consequences of these calamities are numerous, other than the initial traumatic injuries and fatalities. There is often destruction of important infrastructures such as hospitals, thus compromising the health care delivery system and increasing the risk of communicable diseases post disaster. Basic facilities such as access to clean water and food become disrupted, as the survivors struggle to recover during the aftermath. The damage is even more devastating when there are human lives lost due to the disaster. At times, countries or provinces take years to recover from the impact, depending on the economic stability and extend of the damage caused.

The developing and third world regions are especially vulnerable and the International Decade for Natural Disaster Reduction (IDNDR) highlights the importance of prevention as well as minimizing the effects of natural disasters in these regions (Irasema Alca´ntara-Ayala, 2002). This is due to the fact that in the aftermath of a high impact disaster, recovery is a long and often painful process. An

important adverse effect that should not be overlooked is the psychological impact of disasters and the resulting mental health disorders among those who survive it (Carroll *et al.*, 2010).

1.1.2 Psychological Distress and Disaster

There have been many studies that explored psychological distress during and in the aftermath of disasters. The term 'distress' refers to discomfort, related to symptoms experienced in response to a physical or emotional situation (Ridner, 2004). The term psychological distress is used to describe the negative emotional and cognitive consequences in people who have been exposed to traumatic events such as disasters. There has been focus on Post Traumatic Disorder (PTSD), Depression and Anxiety as mental health problems that are highly associated with both natural and man-made disasters.

It is important to recognize these conditions due to their possible long term impact on those affected, so that early intervention can be provided as part of disaster management. The failure to detect the symptoms of these disorders would result in not only individual loss of functioning but an overall increase in psychiatric morbidity of the population in the post-disaster period (Ursano *et al.*, 1995; Tural *et al.*, 2004; Adams and Boscarino, 2006).Often in the aftermath of a major disaster, those affected not only experience loss of property but also suffer from emotional and psychological distress (Nasir, Zainah and Khairudin, 2012). In an empirical review article, Norris *et al* (2002) examined the psychological effects of disasters and found that PTSD was the most common (68%), while depression was the second most common, at 36%.

1.1.3 Major Flood Disaster in Malaysia, in the year 2014

Malaysia, being a tropical country, is vulnerable to flood disasters which occur due to the yearly monsoon season. Rapid urbanization has also been implicated as contributing to the increasing severity of this natural disaster over these past few decades, affecting the Peninsula as well as Sabah and Sarawak. The rise of buildings, new settlements and deforestation have greatly increased the flood vulnerable areas, with more urban areas being affected (Chan, 2015) . Within Peninsula Malaysia the floods most often affect the East Coast regions which include the states of Kelantan, Terengganu, Kedah, Perlis and Pahang.

Floods have been identified by the Ministry of Natural Resources and Environment as Malaysia's most hazardous natural disaster. In this country, there have been major incidences of floods in the years 1967, 2206, 2007, and 2010. Nevertheless, the recent massive flood disaster that ravaged the country in the year 2014 has been recorded as the worst in the history of the state of Kelantan (Malaysia's National Security Council or NSC). The flood disaster, which began in December 2014, was caused by unexpectedly heavy and continuous rainfall, resulting in rapid rise of the river levels. The NSC's Secretary Datuk Mohamed Thajudeen Abdul Wahab had commented that the water levels recorded were higher than in the 1967 major flood disaster (The Malay Mail, March 7, 2015).

In Kelantan alone the number of evacuees reached 329,441, which was the highest number recorded in the history of floods within the state. The major districts were the worst affected, which included Kuala Krai, Gua Musang,Tanah Merah, Manik Urai

and Kota Bahru. Thousands permanently lost their homes and the post flood restoration is estimated to cost RM 78 million, according to the Kelantan's Flood Disaster Operations Committee chairman Datuk Seri Mustapa Mohamed. The extent of the flood was largely unexpected, and the governmental organizations as well as the victims were unprepared to face such a crisis. The flood relief centres were overcrowded within days with evacuees, with limited resources and disrupted emergency aid. Rescue and relief operations were undertaken in hazardous conditions, and many places became rapidly inaccessible.

In any disaster, efficient and fast delivery of emergency services is the most important aspect of crisis management. Apart from assisting evacuation, providing temporary shelter and delivery of food and clean water, medical services become vital. During the flood, medical services were disrupted to a great extent and in Kuala Krai, the only district hospital was affected by the rising water levels as well as power cut. Despite this, the hospital became an unofficial flood relief centre providing not only shelter but also emergency medical care to the victims. The health care staffs of Kuala Krai were called in to provide medical relief work and majority were untrained in disaster management. A total of 202 hospital staffs were recruited to function as medical relief workers during the flood disaster.

1.1.4 Role of relief workers in disaster

Relief workers provide a broad range of services in disasters, which include assisting evacuation, delivering basic provisions such as food and water as well providing necessary care for the victims. Their role differs from those of emergency rescue workers who are highly trained personals and are involved in rescuing victims, retrieving casualties of the disaster and maintaining safety. Rescue workers who

respond to disasters are commonly the fire fighters, the army and disaster emergency responders. Relief workers on the other hand, may be trained or recruited from volunteers who have limited or no experience in providing disaster related services. Medical relief workers play an important role in providing medical care to victims and are exposed to the hazards of disaster themselves in their line of duty (Fullerton *et al.*, 2004; Sakuma *et al.*, 2015). This has prompted many studies to explore the risk of psychological distress in disaster relief workers, and to identify factors that increase their vulnerability to develop PTSD, Depression and Anxiety during and in the aftermath of a disaster. In Malaysia, studies related to psychological impact of disaster is limited and as to the knowledge of the researcher, there has not been any research on the mental health effects of disaster on medical relief workers.

The recent flood disaster in Malaysia has been an eye opener and there is now an urgent need for better disaster management plan. This includes not only disaster related training but addressing the mental health of the relief workers and providing early intervention when necessary. Identifying factors that contribute to the development of psychological distress among the highly skilled relief workers such as medical staffs would pave the way for better disaster preparedness and reducing mental health morbidity among this population (Chan and Huak, 2004; E. Connorton *et al.*, 2012)

1.2 Literature review

1.2.1 Definition of Medical Relief Workers

The term relief worker broadly describes individuals who work for an agency or organization, to provide aid for people in need (Oxford University Press, 2014).

Emergency relief work during a disaster refers to life saving operations which recruit workers on short notice, for a short implementation period. There are a wide range of relief workers, from untrained volunteers or civilians, semi-skilled workers such as drivers or guards to highly skilled medical based relief workers that include doctors and medical assistants (Connorton *et al*. 2012).

During large impact disasters, relief workers are needed for mobilization of resources, focussing on ensuring the safety of those involved as well as to minimize loss (Rotolo and Berg, 2011). Apart from rescue and life-saving missions during a disaster, providing health care services to the population affected is a major concern (Yamanouchi *et al.*, 2014). Access to medical services are often disrupted during disasters due to destruction of infrastructure such as hospitals and roads, power cuts, and when the health care providers do not have a safe environment to work in. While some countries specifically train medical relief workers to respond during a crisis or disaster, others rely on disaster naïve medical staffs to step in during an unanticipated calamity such as the major flood that hit Malaysia recently in the year 2014.

1.2.2 Psychiatric Morbidity and psychological distress in disaster relief workers

Disaster relief workers worldwide have been found to be at increased risk of developing PTSD and other trauma related mental health disorders including Depression, Anxiety and Stress (Marmar *et al.*, 1999; Neria, Nandi and Galea, 2008). This is due to their primary and secondary exposure to the dangers of the disaster, life threatening experiences, and witnessing the suffering of others (Connorton *et al*. 2012). In fact many psychiatric disorders related to rescue or relief work and exposure to disaster might not emerge until months or years after the events took place (Morren *et al.*, 2007).

PTSD is characterised by symptoms of increased arousal, re-experiencing and avoidance behaviour in response to a traumatic or life threatening event. The important traumatic events include war, disasters, personal assault, experiencing major accidents, witnessing deaths or severe injuries and being a victim of abuse. It is associated with high levels of morbidity and impaired functioning, as well as decreased quality of life in those affected (Christianson and Homecare, 2013; Harvey *et al.*, 2016). Its worldwide prevalence is about 5-10% of the population, and is higher among women compared to men (Yehuda *et al.*, 2015). It is estimated that about 60.7% of men and 51.2% of women could be exposed to a traumatic event at least once in their lifetime (Javidi and Yadollahie, 2012).

Depression is a mental disorder that affects approximately 130 million worldwide and is a major cause of global burden of disease (World Health Organization, 2012) . The core symptoms are low mood, anhedonia, change in sleeping patterns and appetite, feelings of hopelessness and suicidal ideation. The illness is diagnosed based on the symptom criteria listed in the DSM-V. Anxiety is a mental state of being on the edge or keyed up, excessively worried, and experiencing a myriad of other cognitive and vegetative symptoms such as poor concentration and sleep disturbances. It is often a common reaction to stress, and occurs in anticipation of a potential or real threat (Gross and Hen, 2004). However, it becomes a disorder when the reaction is out of proportion to the actual threat and causes dysfunction. Stress, on the other hand is a psychological and physiological reaction to an adverse situation and its prolonged exposure is known to cause other mental health disorders (Cohen *et al.*, 2012). For example chronic stress has also been implicated with the onset of depression and anxiety (Hammen, 2005) and has an important role in the development of PTSD (Brewin and Holmes, 2003).

Although PTSD is the most commonly studied psychiatric disorder in relation to disaster, Depression, Anxiety and Stress have also been found to occur among the victims and relief workers, especially during the post disaster period when recovery and restoration work begins (Dolce and Ricciardi, 2007; Qu, Wang and Tian, 2012; Sakuma *et al.*, 2015). There are many studies worldwide that addressed the psychological impact of working as disaster relief workers and the findings vary depending on the region, cultural background and the type of disaster experienced. The prevalence of PTSD in disaster rescue and relief workers, for example, shows a fairly wide range. Occupations involving relief and rescue work had a collective prevalence ranging from the 5% to 32%, with highest found in rescue personnel, fire fighters and workers who received no prior training (Javidi and Yadollahie, 2012)

In another systematic review involving 28 studies on PTSD prevalence among disaster rescue workers and medical relief workers, the world wide pooled prevalence was found to be 10% (Berger *et al.*, 2012). The prevalence rate was noted to be higher in Asian countries compared to western nations. Still other studies reported higher prevalence of PTSD of between 11-32%. Fullerton et al. 2004, in a comparative study of exposed disaster workers and unexposed control group, reported the prevalence of PTSD to be 16.7%. The exposed rescue and relief workers were 7.33 times more likely than the unexposed group to develop PTSD.

Most studies that have examined PTSD among disaster workers have also focussed on Depression, Anxiety and Stress, as important psychological sequelae of trauma exposure. Fullerton *et al* (2004), in the same study, found that depression was present in 16.4% of exposed workers while 25.6% experienced acute stress reaction. Depressive symptoms are characterized by low mood, anhedonia, sleep and appetite disturbances to name a few. Diagnosis is made based on the criteria listed Diagnostic