



Symptoms Description of Family Post Traumatic Stress Disorder of the Mount Merapi Eruption Disaster Victims during Covid19

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Abstract

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BACKGROUND: Volcano disaster can cause psychological problems such as Post Traumatic Stress Disorder (PTSD). PTSD is an anxiety disorder caused by a scary or frightening, unpleasant and challenging event or experience with physical abuse or threatened feeling.

AIM: The purpose of this study was to describe the symptoms of PTSD experienced by families after the volcanic eruption disaster in Magelang Regency.

METHODOLOGY: This research was conducted with a descriptive-analytic strategy. The research population was community aged 15–64 years, with a total of 574 people, and 86 respondents were selected as samples using a quota sampling technique.

RESULTS: The results show that the majority of respondents experience symptoms of PTSD in the mild category as many as 60 respondents with a percentage of 68.9%. However, there are two respondents included in the severe category. The results of this study are expected to be the basis for the community and other institutions to pay attention to the symptoms of PTSD.

CONCLUSION: Respondents who are categorized as experiencing weight PTSD symptoms are expected to conduct further examinations at health services immediately; therefore, PTSD can be handled.

Introduction

The experience of stressful events increases the risk of psychological distress, including post-traumatic stress disorder (PTSD) in survivors [1] has been found by many researchers working in disaster areas. Apart from causing substantial financial losses and causing physical injury [2], [3], [4], natural disasters such as earthquakes [5], hurricanes, tornadoes, floods, volcanic eruptions, and fires can also cause PTSD symptoms and several other physical and emotional health problems [6]. The mental effects have been documented not only in the values of post-traumatic stress symptoms and post-traumatic stress disorder, but also for depression and other mental health problems [7], [8], [9].

Natural disasters may have immediate and long-term effects [10], [11]. Volcanic eruptions occur without warning, leaving people without the opportunity to make psychological adjustments to face the disaster, leading to emotional effects ranging from despair to severe mental health problems, especially PTSD [12]. A study in Ethiopia reported a very high prevalence of

PTSD (37.3%) [13]. These results highlight the need to clarify the long-term effects of catastrophic volcanic eruptions on the mental health of victims.

Several studies show that PTSD is highly correlated with the consequences of volcanic eruptions and related variables [14], [15], [16]. For example, volcanic eruptions can also cause interpersonal trauma through the loss of loved ones and physical and psychological injuries [15], [16].

Publication on the impact of natural disasters on survivors in Indonesia, particularly survivors of volcanic eruptions, is very limited. The latest research report on natural disasters in Indonesia is the research conducted by Irmansyah *et al.* [17] and Musa *et al.* [18], both studied the impact of the 2004 tsunami in Aceh. A recent study on the 2010 eruption of Mount Merapi, conducted by Murphy [19], describes women's cultural perspectives on mental health and disaster after the event. The results of a preliminary study in Magelang found that although during the eruption there were no victims (died), the community said they were always worried and alert, primarily when a sudden volcanic eruption occurred while the community was asleep,

causing the community to be hit by heaps of volcanic eruptions. In this study, we investigated through a survey of PTSD symptoms in survivors in areas prone to volcanic eruptions.

Methods

A survey study research design was conducted in the Magelang area 9 years after the catastrophic eruption of Mount Merapi in 2010. The study was conducted on 86 people aged 15–60 years in the Magelang region with inclusion criteria: families who experienced the catastrophic volcanic eruption in 2010, families who have lost property or family, and the family was detected as having experienced trauma through the impact of event scale-Revised questionnaire screening. The researcher used the convenience sample technique to determine the number of samples based on the inclusion criteria.

Ethical approval

This research was approved by University of Indonesia with number SK-112/UN2.F12.D1.2.1/ETIK 2021, and the Office of Investment and One-Stop Services, Magelang Regency. The study procedure was carried out according to the ethical standards set out in the 1964 Declaration of Helsinki. Following Indonesian law, written consent was obtained from the subject, local education authorities, and local government authorities. Before each data collection session, participants were informed that their participation was voluntary and that they had the right to withdraw from the study at any time without any sanction.

Questionnaire

Before the distribution of the questionnaire, potentially confusing items were identified and rewritten in the local dialect. If respondents had difficulty with the survey, team members would help them to understand the questionnaire and complete the survey. Participants were encouraged to fill out the questionnaire in person. The assessment questionnaire consists of two parts. The first part collected necessary demographic information (age, gender) and experiences on the 2010 eruption of Mount Merapi (yes/no). The second part asked participants about exposure to volcanic disasters and PTSD symptoms.

PTSD symptoms were assessed using the Impact Event Scale-Revised [20], [21], the scale was used as a screening tool for respondents according to the inclusion criteria. In this study, Impact of Events Scale-Revised (IES-R) was translated into Indonesian following the appropriate process. Tool testing

showed high internal consistency for the total scale (Cronbach's alpha = 0.90) and for the three subscales (Cronbach's alpha for intrusion = 0.85, avoidance = 0.75, and hyperarousal = 0.74) [22]. After translation and tool testing, no scale modification was required, but some words were replaced with those deemed more culturally appropriate. For example, the word "upset" in the original questionnaire was translated as sad instead of angry because it was considered more culturally appropriate. In addition, it is difficult to find a suitable translation for the word "numb" because this feeling does not exist in Indonesian, therefore a similar expression is included which is considered to be closely related to its meaning. This self-report scale was shown to be a reliable indicator of PTSD symptoms in individuals exposed to disasters [22]. This scale was specifically designed to screen and assess the severity of PTSD in disaster victims, rather than a formal diagnosis. Each question was answered on a four-point scale (0, not at all; 1, little; 2, enough; 3, a little more; 4, very much) with no items being reversed. The total score (ranging from 0 to 88) was used as an indicator of the severity of the post-traumatic stress reaction, where a total score of 37 or higher was defined as having PTSD symptoms [20], [21]. The IES-R instrument had also been carried out the construct validity test with the results of the alpha coefficient being 0.89 for the intrusion subscale, 0.85 for the avoidance subscale, and 0.83 for the hyperarousal subscale [21].

Findings

Descriptive statistics for the study population are shown in Table 1. A total of 86 participants were surveyed, most respondents aged 26–45 years as many as 58 respondents (67.4%). Meanwhile, 15–25 respondents (17.4%) and 46–64 years old were 13 respondents (15.2%). Most gender respondents were males, amounting to 51 respondents (59.3%), and females respondents amounting to 35 respondents (40.7%). All respondents were Muslims (100%). The most recent education of respondents was elementary education, amounting to 34 respondents (39.6%), while the last education for Sekolah Menengah Pertama and Sekolah Menengah Atas/Sekolah Menengah Kebangsaan was 26 respondents (30.2%) respectively.

Table 1: Respondent Characteristics

Characteristics	PTSD Symptoms						Total	
	Mild		Moderate		Severe		f	%
	f	%	f	%	f	%		
Ages (year)								
15–25	11	12,8	4	4,7	-	-	15	17,4
26–45	44	51,2	12	13,9	2	2,3	58	67,4
46–64	7	8,1	6	7	-	-	13	15,2
	62	72,1	22	25,6	2	2,3	86	100,0
Sex								
Male	38	44,2	12	13,9	1	1,2	51	59,3
Female	24	27,9	10	11,6	1	1,2	35	40,7
	62	72,1	22	25,6	2	2,3	86	100,0

Most respondents' occupations were farmers, amounting to 51 respondents (59.3%), while the second-largest was self-employed, amounting to 20 respondents, then households amounting to 11 respondents (12.8%), and others (students) totalled four respondents (4, 6%). More males than females were afraid, and they showed more PTSD symptoms.

The overall prevalence of severe PTSD symptoms was the same between male and female 1.2%; aged 26–45 years experienced PTSD at most of 67.4%. Most of the symptoms of PTSD that appeared in the victims of the volcanic eruptions were mild symptoms, which means that the respondent did not have PTSD ultimately, only a few PTSD symptoms appeared with 62 respondents (72.1%). However, there were two respondents (2.3%) who experienced PTSD symptoms in the severe category.

Discussion

In this study, we investigate factors that contribute to PTSD in families several years after the 2010 eruption of Mount Merapi. We found that volcano exposure trauma was the most influential contributor to PTSD symptoms, while post-disaster negative life events contributed to a higher degree of depressive symptoms. PTSD symptoms and depression were highly correlated, with comorbidity of 10.7% (male 3.4%, female 7.3%).

More participants showed depressive symptoms (29.7%) than PTSD symptoms (19.6%), which is consistent with previous research observations [23]. It has been suggested that these PTSD symptoms can be reduced or even eliminated if individuals receive intervention and care for an volcano disaster [24], [25]. After the 2013 Lushan earthquake, mental health professionals assigned to earthquake disaster areas played a very important role in the prevention and mitigation of PTSD symptoms [23].

PTSD and depressive symptoms are more common in girls than boys, as has been observed in previous studies [15]. Boys were also more likely to be afraid of earthquakes and to experience more interpersonal stress and learn stress in their daily lives, while boys were more likely to experience physical injury due to earthquakes and suffer more risk factors for punishment in their daily lives. Previous studies have shown that the financial and physical care burdens are shared by the community when members have physical injuries, while little attention is paid to mental trauma [26]. Therefore, physical injury may be easier to deal with than mental trauma because individuals with physical injuries can rely on strong community support [25]. Girls have a greater subjective fear of earthquake exposure than boys, and this may be an

important contributor to more mental health problems in girls [27], [28]. Interpersonal stress factors and learning are the most important risk factors for girls, perhaps because traditional families in remote mountainous areas in China tend to pay less attention to girls than boys, which can result in girls experiencing a lack of parental love and attention [26]. Clinical trials report that sex differences in depressive symptoms begin to appear after age 10 years [5], [29]. When the Lushan earthquake hit, all participants were over 13 years old. Symptoms of depression generally occur around 13 years of age in girls; however, the incidence is high after age 15 years [6], [30]. In contrast, boys have lower levels of depressive symptoms and generally smoother emotional development.

In this study, major trauma exposures included earthquake-related exposure, post-earthquake negative life events, abandonment by parents, and pre-2008 Wenchuan earthquake exposure. All trauma exposures contributed to PTSD symptoms and depression in a stepwise regression model. Exposure to traumatic disasters is one of the most important factors in the development of psychiatric symptoms [6], [31]. Experiencing the death of a relative or being injured or being trapped in an earthquake are risk factors for possible PTSD after earthquake trauma [31]. Subjective fear and self-perceived exposure to trauma also contribute to PTSD and depressive symptoms [25]. Previous exposure to the 2008 Wenchuan earthquake was associated with a higher risk of PTSD and depression symptoms, consistent with previous research showing that prior trauma increases the risk of PTSD and subsequent depressive symptoms [32]. One of the most important post-earthquake negative life events for Chinese children and adolescents is academic stress, which is one of their biggest sources of mental stress because they are under intense academic pressure [6], [33]. As a result, students with learning disabilities sometimes commit suicide or suffer from symptoms of depression and anxiety [3], [34].

Interpersonal problems are another important risk factor for possible depression [3]. Parental migration increases the risk of several negative life events, including physical abuse, emotional neglect, and exploitation [6], [35]. In the absence of one or both parents, children who are left behind have to adapt to changes in family structures and face emotional difficulties caused by separation from parents and inadequate parental care [6], [36].

PTSD symptoms were positively correlated with depressive symptoms in our study, which is consistent with the results of previous studies [37], [38]. Depressive symptoms explain 17% of the variability in the PTSD model, whereas PTSD symptoms explain 24.1% of the variability in the depression model. One potential explanation is that PTSD symptoms may have caused or worsened depressive symptoms; alternatively, it may be that a previous history of depression predisposes to

PTSD [5], [37]. Several studies have found that PTSD and depression symptoms often occur simultaneously in earthquake survivors [3], [6], [32]. It has been suggested that PTSD and depressive symptoms may share underlying negative effectiveness, which may explain their comorbidity. In this study, PTSD and depressive symptoms had the same risk factors. Further studies should be done to determine if this helps to explain the comorbidity between PTSD and depressive symptoms.

Univariate analysis

The results of the research that had been conducted on 86 respondents in Suwating village found that most of the respondents experienced symptoms of PTSD in the mild category with 60 respondents (69.8%). It can be seen from the frequency of the number of symptom scores that appear based on the IES-R questionnaire. PTSD is said to be mild if the total score from the IES-R questionnaire with 22 questions is a score of 24–32.

Some major events that occur or are experienced in a person's life, both pleasant and unpleasant events, will give changes to an individual's life as a result of what they experience. These changes can cause stress. The stress experienced can lead to pressure or demands experienced by the individual; therefore, he or she adapts or adapts. Stress has broad implications for both physical and psychological problems. The effects of stress can cause adjustment disorders related to maladaptive reactions to stress, such as PTSD [39], [40].

The responses found from respondents in this study were in the form of negative responses and positive responses. Negative responses are grouped into two symptoms, including re-experience and hyperarousal symptoms such as recalling events, difficulty sleeping, irritability and anger, difficulty concentrating, nightmares, alertness, and others. Positive responses are in the form of avoidance symptoms, such as trying not to remember events and trying not to talk about these events.

From the results of the study, most of the negative responses that appeared in the hyperarousal symptom group were respondents who felt very alert/worried about the catastrophic volcanic eruption. In the re-experience symptom group, the respondent recalled the event. The positive response is in the avoidance symptom group. Most of the responses that emerged were respondents trying to avoid thoughts of trauma.

According to Guo, Liu [24], PTSD itself is an individual response to a traumatic event in the form of symptoms. This condition will have a psychological impact in the form of behavioral disorders ranging from excessive anxiety, irritability, sleeplessness, tension, and various other reactions. PTSD may last for months, years or up to decades and may only appear

after exposure to a traumatic event. Furthermore, PTSD is caused by events that shake the emotions of a person or events that cause strong fear [41]. The results showed that respondents experienced the symptoms of PTSD in the moderate category, which means that the number of respondents was 24 (27.9%) with a possible diagnosis of PTSD. PTSD is said to be moderate if the total score of the IES-R questionnaire with 22 questions is a score of 33–36.

The results of the study also found that respondents who experienced symptoms of PTSD were in a severe category, which means that it was sufficient to suppress the function of the immune system in the respondent's body with two respondents (2.3%). PTSD is said to be moderate if the total score of the IES-R questionnaire with 22 questions is a score of 37 or more.

Other study explains that the risk factors for experiencing PTSD are living in trauma and danger, having a history of mental illness, getting injured, feeling scared, and helpless [42]. Meanwhile, factors that can reduce the risk of PTSD include seeking support from other people such as colleagues and family, seeking group support after a traumatic event, and feeling good about one's actions in the face of danger.

The symptoms of PTSD can disappear throughout the patient's life; therefore, they can interfere with work function and life effectiveness [43], [44]. Our findings were in consistency with existing researches. The last decade has also witnessed a growing interest in individuals with positive psychological characteristics on resilience, such as optimistic, self-esteem, sense of meaning and purpose [45].

Females have a greater risk of experiencing psychological distress [46], [47], one of which is PTSD. Perceptions or ways of looking at an event between males and females are different. Females have a more subjective view of threats, not from an objective point of view. When a disaster occurs, females tend to perceive disaster as a frightening event. Furthermore, females have perceptions and thoughts on many things, such as their children, their families, their economy, and others. It makes the perception of females narrow and easy to worry. This perception is what makes females prone to PTSD.

In this study, most of the research respondents were male, amounting to 51 respondents (59.3%) and female 35 (40.7%). However, from the results of the study, although the male respondents' number was larger than the females, the females were more dominant, experiencing moderate to severe symptoms of PTSD.

The results showed 86 respondents (100%), 58 respondents (67.4%) aged 26–45. Forty-four respondents (51.2) had mild PTSD symptoms, 12 respondents (13.9) had moderate PTSD symptoms, and two respondents (2,3) had severe PTSD symptoms.

The older a person has a greater risk of suffering the impact of morbidity due to both physical and psychological disasters [16], [24]. Norris *et al.* argue that middle-age adults are more susceptible to the impact of an incident because someone in middle age is responsible for the financial burden of the family.

The study explained that the age difference did not make a significant difference in the level of PTSD. It is consistent with the study of [1], which stated that they did not find a significant difference between age and PTSD levels after the disaster. It can be seen from the percentage of survivors who experience PTSD, both adolescents and adults, dominated by moderate category PTSD, namely 53.85% for adolescents and 53.12% for adults.

The level of education can influence individual coping strategies [40]. The results showed that 86 respondents (100%), 34 respondents (39.6%) had elementary school education, 24 respondents (27.9%) had mild PTSD symptoms, and ten respondents (11.6%) had moderate PTSD symptoms.

A person with low education has little information about coping strategies or resilience about disasters such as volcanic eruptions. Most of the time of the disaster, they panic, worry about various things, and this can lead to destructive coping. Therefore, those people experience PTSD from a volcanic eruption disaster.

The lack of knowledge about the signs and symptoms of PTSD that an individual gets will affect the signs and symptoms they have. In the study, it was found that before therapy, individuals with PTSD thought that the problems they experienced after a disaster were normal, even though it interfered with their daily activities. Because of this ignorance, individuals with PTSD do not try to find a way out of the problems they face [15].

Research strengt

This study specifically analyzes the symptoms of PTSD experienced by families of victims of volcanic eruptions in Indonesia, because it is the most frequent disaster in Indonesia after floods, earthquakes, and landslides.

Conclusion

In this study, we found that traumatic exposure was an important risk factor for PTSD in this group. Natural disasters have an even greater impact on PTSD symptoms. Further studies must be carried out to confirm these findings.

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