

ORIGINAL RESEARCH

THE EFFECT OF POST-TRAUMATIC STRESS DISORDER ON WOMEN AFTER THE EARTHQUAKE IN CENTRAL SULAWESI

Pengaruh Post-Traumatic Stress Disorder Pada Wanita Pasca Gempa Bumi di Sulawesi Tengah

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ABSTRACT

Background: Posttraumatic stress disorder (PTSD) is a psychological disorder caused by uncommon occurrences such as threats or catastrophic events. Women are particularly susceptible to developing PTSD, as they have a range of threat perceptions. **Purpose:** The aim of this study was to examine the effect of PTSD on women survivor of the earthquake in the Sigi Biromaru sub-district of Central Sulawesi. **Methods:** This was a descriptive study conducted using a cross-sectional design. The population for this study were housewives who have been displaced by the earthquake and are currently residing in temporary shelters (Huntara) in a village located in the Sigi Biromaru sub-district. The instrument used in this study was the PTSD measurement questionnaire sheet. It was conducted from March to April 2020 and included a total of 115 participants. Univariate analysis was used to determine the respondents' characteristics, including their age, education, occupation, income, and a description of the PTSD condition. **Results:** The results show that the majority of respondents experienced severe PTSD (70.43%). Most of the respondents (35.65%) were between the ages of 37 and 46, were senior high school graduates (40%), were unemployed (74%), and had earnings of < 2,500,000 (85.22%). Three variables that affect PTSD are education with a p-value of $0.03 < 0.05$, job/occupation with a p-value of $0.02 < 0.05$, and income with a p-value of $0.03 < 0.05$. **Conclusion:** Women who are elderly, have a low level of education, are unemployed, and have low income are more vulnerable to experiencing PTSD.

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ABSTRAK

Latar Belakang: *Post Traumatic Stress Disorder (PTSD)* adalah gangguan psikologis yang disebabkan oleh hal yang tidak biasa seperti ancaman atau peristiwa bencana. Wanita adalah kelompok yang sangat rentan untuk mengalami PTSD karena wanita memiliki cara pandang yang lebih perspektif terhadap suatu ancaman. **Tujuan:** Penelitian ini bertujuan untuk menganalisis pengaruh PTSD pada wanita korban gempa bumi di Kecamatan Sigi Biromaru Sulawesi Tengah. **Metode:** Penelitian ini adalah penelitian deskriptif dengan menggunakan rancang bangun cross sectional. Populasi pada penelitian ini adalah yang berstatus sebagai Ibu Rumah Tangga yang terdampak gempa bumi dan tinggal di Hunian sementara (Huntara) di Desa yang berada di Kecamatan Sigi Biromaru. Instrumen yang digunakan dalam penelitian ini adalah lembar kuesioner pengukuran PTSD. Total sampel sebanyak 115 orang. Penelitian ini dilakukan pada bulan maret-april 2020. Analisis data menggunakan analisis univariat untuk mengetahui karakteristik responden yang meliputi umur, pendidikan, pekerjaan, penghasilan dan gambaran keadaan PTSD. **Hasil:** Hasil penelitian menunjukkan bahwa sebagian besar responden berada pada kondisi PTSD berat atau PTSD severe (70,43%). Sebagian besar responden berada pada rentan usia 37-46 tahun (35,65%). Berpendidikan SMA (40%), Tidak bekerja (74% dan berpenghasilan <2.500.000 (85,22%). Tiga variabel yang berpengaruh terhadap PTSD yaitu pendidikan dengan nilai (p -value $0,03 < 0,05$), pekerjaan dengan nilai (p -value $0,02 < 0,05$) dan penghasilan dengan nilai (p -value $0,03 < 0,05$). **Kesimpulan:** Wanita yang memiliki usia tua, pendidikan yang rendah, tidak bekerja dan memiliki penghasilan rendah lebih rentan mengalami PTSD.

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INTRODUCTION

Earthquakes are vibrations or shocks that occur on the earth as a result of the earth's plates colliding; however, earthquakes can also be caused by volcanic activity or debris in rocks (Utomo & Purba, 2019). Sulawesi is situated between three earth plates: Indo-Australian, Eurasian, and the Philippines. This condition makes the island of Sulawesi very vulnerable and prone to tectonic earthquakes. One of the active faults is the Palu Koro fault, stretching 240 kilometers from north (Palu City) to south (Malili) to the Bone Bay (Pakpahan, Ngadmanto, & Masturyono, 2015). When an earthquake strikes a region, it frequently results in fatalities and property damage, whether from dead or injured survivors or damage to public facilities and community property. Earthquakes cause not only physical trauma but also psychological trauma to their survivors. Although

the traumatic circumstances under which the disaster survivors find themselves are extremely varied, the most common symptoms are psychological disorders, one of which is known as PTSD. It is a psychological disorder caused by uncommon occurrences such as threats or catastrophic events (Dai et al., 2016).

The prevalence of PTSD in Wenchuan was generally around 1.92% in affected areas and around 2.71% in severely affected areas (Du et al., 2018). Dwidiyanti, Hadi, Wiguna, & Ningsih, (2018) revealed that according to WHO data from 2013, the majority of disaster survivors have normal psychological reactions following the disaster, 15–30% develop mild mental disorders or PTSD, and 3–4% develop severe psychological disorders such as psychosis, major depression, and high anxiety. A systematic review on mental health following the 2011 earthquake in Japan discovered that approximately 10–53% of the

population experienced PTSD after the earthquake, while approximately 3–43% of earthquake survivors experienced depression. The prevalence of PTSD in Japan 14 months after the earthquake was 15%, while the prevalence of PTSD in China five years after the earthquake was 5% (Dahal, Kumar, & Thapa, 2018).

On August 5, 2018, a magnitude 7RS earthquake struck Lombok island. According to the findings of a survey carried out after the earthquake in Lombok, there is still a significant number of people who are fearful or concerned about the possibility of another earthquake. Around 64% of Lombok earthquake survivors experienced PTSD symptoms (Dwidiyanti, Hadi, Wiguna, & Ningsih, 2018). On September 28, 2018, a magnitude 7RS earthquake struck Palu, Central Sulawesi. Around 4,340 people died or went missing due to the disaster, 4,438 people sustained serious injuries, and approximately 172,635 people were displaced. Sigi Biromaru sub-district was one of the areas affected by the disaster, with 464 people killed and 1,234 houses damaged, resulting in the displacement of around 1,689 households (National Agency for Disaster Management, 2018).

Disaster survivors require immediate medical attention to ensure their safety. Everyone, particularly those who belong to disaster-prone community groups, is entitled to social protection and a sense of security. People included in vulnerable groups are women, the elderly, children, disabled people, migrants, and local indigenous people. Women are a particularly vulnerable group that requires special attention in the aftermath of a disaster. Women's vulnerability is deeply rooted in gender inequalities that limit their mobility, leaving them less able to protect themselves from the consequences of the disasters they have experienced (Aftrinanto, Hayati, & Urbayatun, 2018). Several factors can trigger the onset of PTSD, one of which is gender, and it has been established that PTSD is more prevalent in women (Hatta, 2016). According to Anam, Martiningsih, & Ilus (2016) and Ciocca et al (2015), women are more at risk of experiencing psychological distress when exposed to disasters. In addition, the way women perceive an incident has a threat component. As many as 45% of women who have been exposed to disasters had PTSD. The post-disaster psychological impact is more common in women than in men. Women are more likely to develop post-disaster PTSD (Surwaningsih, Muhafilah, & Herawati, 2019). Another study carried out after the earthquake in

Lombok showed that as many as 64% of women experienced PTSD (Dwidiyanti, Hadi, Wiguna, & Ningsih, 2018). Additionally, Fang et al. (2015) discovered a higher prevalence of PTSD in women, at 48%.

PTSD has also been found to impair the abilities of internally displaced people (IDP), as well as those of their families, communities, and society as a whole. The experience of homelessness can exacerbate the IDP's already severe psychological distress and increase their risk of developing PTSD. The prevalence of PTSD among IDP increased between 5–31% but remained between 4–7% in general (Haagen, ter Heide, Mooren, Knipscheer, & Kleber, 2017; Kazour et al., 2017).

According to a preliminary study conducted in one village in the Sigi Biromaru sub-district, most respondents who stated they had been traumatized by the disaster were adults and older women. Most of them said that they continued to imagine the traumatic events, became easily startled, and had difficulty sleeping. Based on this incident, the likelihood of survivors living in the shelters developing PTSD disorders is very high. Women are a particularly vulnerable group for developing PTSD, so the study focused exclusively on them. The purpose of this study was to examine the impact of (PTSD) on women survivors of the earthquake in Sigi Biromaru sub-district according to their age, education, and occupation.

METHODS

This study employed an analytical approach with a cross-sectional design. The study population consisted of 1689 women with the status of homemakers who were displaced by the earthquake and were housed in temporary shelters (Huntara) in Mpanau Village, Jono Oge Village, Lolu Village, and Sidera Village. The study sampled 115 respondents, using a simple random sampling method, which involved selecting members of the sample from the population randomly through a draw/lottery. This study was conducted from March to April 2020. The instruments used in this study were the research instrument sheet and the PTSD scale measurement questionnaire. This study employed a descriptive test as its statistical analysis method. The analysis was carried out to determine the mean, median, and percentage values. Additionally, this study used a cross-tabulation to assess the risk factors associated with each variable. The variables in this

study were age, education, employment status, and income. The data were analyzed using univariate analysis. This study was approved by the Ethics committee of the Faculty of Dentistry, Universitas Airlangga, Surabaya (ethical number: 064/HRECC.FODM/II/2020)

PTSD is defined in this study as an individual's condition following an earthquake, which is classified into three symptoms: reexperiencing symptoms, trying to avoid thoughts and all things associated with the traumatic event (avoiding symptoms), and signs of excessive alertness that usually interfere with the individual's everyday life (hyperarousal symptoms). Measurement of PTSD signs and symptoms experienced by individuals was carried out using the DSM-5 Diagnostic and Statistical Manual of Mental Disorders questionnaire. The questionnaire used was a screening (PCL), which was translated into Indonesian. The questionnaire consisted of 19 questions and was scored on a Likert scale from 0–85. The questions were scored using the following scale: 4 = always, 3 = often, 2 = rarely, and 1 = never. The 19 items measured yielded a score ranging from 24–37. The scores were categorized into three categories: partial, full, and severe.

The respondent's age was calculated from their date of birth to the time of the study. The respondent's occupation was defined in this study as the current effort made by them or their family to obtain financial rewards. The education examined in the study was the respondent's formal education up to graduation/completion. Finally, the income studied was the respondent's or their family's monthly income following the earthquake.

RESULTS

The results indicate that 35 respondents (35.65%) were in the age group of 37–46 years (Table 1). With 46 respondents (40%), the majority were senior high school graduates (Table 1). In addition, of 85 respondents (74%), most of them were unemployed or housewives (Table 1).

Income received by the respondents or their families every month following the earthquake ranged between Rp. 500,000–Rp. 1,000,000 (with an average of < Rp. 1,000,000). If the income value is compared to the minimum wage in Sigi Regency, which is Rp. 2,500,000, the majority of respondents earn less than the minimum wage. The results of other studies showed that as many as 81 respondents (70.43%) experienced severe PTSD.

From the four variables studied, three variables influence PTSD, namely education with a p-value of $0.03 < 0.05$, job/occupation with a p-value of $0.02 < 0.05$, and income with a p-value of $0.03 < 0.05$, while the age variable did not affect PTSD with a p-value $0.712 > 0.05$. This means that education, job/occupation, and income can all have an effect on the incidence of PTSD (Table 1).

DISCUSSION

Based on the findings, this study is consistent with the one conducted by Hatta (2016), in which it was found that the prevalence of PTSD in women is 70.43%, with a majority of them experiencing severe PTSD. There are several factors for the incidence of PTSD in women. Hormonal factors are believed to be a significant trigger in the incidence of PTSD in women. Women of reproductive age are more likely to experience atypical (unusual) hormone influences that result in different responses to disasters, making them more prone to experiencing PTSD. A study conducted by Sakuma et al (2015) reveals that individuals who survive natural or human-made disasters are more likely to experience PTSD. Psychological stress during and after an earthquake and a person's feelings of fear and helplessness during an earthquake are important factors that contribute to the development of PTSD. This study shows that older women who have been survivors of disasters are more likely to experience psychosocial disorders. Psychosocial disorders are more likely to occur in older adults due to changes in physical and psychological health. This is consistent with a study conducted by Anam, Martiningsih, & Ilus (2016), which found that older adults are more likely to experience the impact of disasters, such as physical and psychological disorders. This study also corroborates the findings of Ando et al (2017), who found that older adults are at an increased risk of developing post-disaster PTSD. Furthermore, the results of this study are consistent with those of Wu, Xu, & Sui (2016) who found that older adults have a significantly higher probability of developing PTSD. This study also corroborates the findings of Tang, Lu, & Xu (2018), who found that age is a high-risk factor for PTSD. Additionally, this confirms a study conducted by Guo, He, Qu, Wang, & Liu (2017), which suggests that being a woman and elderly are significant risk factors associated with PTSD among adults.

Tabel 1.

Distribution of PTSD based on Age, Education, and Occupation of Earthquake Survivors Respondents in Sigi Biromaru sub-district, Central Sulawesi

Characteristics	PTSD			%	<i>p-value</i>	CI 95%
	<i>Partial</i>	<i>Full</i>	<i>Severe</i>			
Age (years)					0.71	0.69–0.71
17-26	0	4	16	17.39		1.61–1.99
27-36	1	2	17	17.39		1.56–2.04
37-46	1	15	25	35.65		1.41–1.76
47-56	1	6	17	20.86		1.43–1.91
57-66	0	1	4	4.34		1.24–2.36
>67	0	1	4	4.34		1.24–2.36
Education					0.03	0.03–0.04
Finished Elementary School	1	11	19	26.95		1.37–1.79
Finished Junior High School	0	2	19	18.20		1.77–2.04
Finished Senior High School	1	13	32	40.00		1.52–1.83
Finished College	1	3	13	14.78		1.40–2.01
Job Status					0.02	0.03–0.03
Doesn't Work	1	22	62	74.00		1.61–1.82
Work	2	7	21	26.08		1.40–1.86
Income					0.03	0.06–0.07
<2.500.000	1	25	72	85.22		1.63–1.82
>2.500.000	2	4	11	14.78		1.16–1.90
Total	3	29	83	100.00		

Another finding from this study is the education level of those who experience psychosocial disorders; most of those who do are women with high school education. The less education a person has, the more vulnerable they are to experiencing post-disaster psychosocial disorders. This study confirms the findings of Guo, He, Qu, Wang, & Liu (2017), who suggest that a lack of education may be an important risk factor associated with PTSD.

Anam, Martiningsih, & Ilus (2016) state that having higher education reduces the negative impact of disasters on individuals because those with higher education have better coping skills, whereas those with lower education have a greater risk of experiencing PTSD because they receive less information about how to survive in the event of a disaster. The findings of this study corroborate those of McBride et al (2018), who found that a person's educational status is a risk factor for developing PTSD. This study is also in line with the findings of Li et al (2020), which states that having less education is one of the risk factors for developing PTSD. The results of this study corroborate those of Ma, Chang, Wu, & Lin (2020), who found that low education is significantly associated with PTSD.

Another finding is that most of the women who experience psychosocial disorders are

unemployed. This finding corroborates Surwaningsih, Muhafilah, & Herawati, (2019) findings that an unemployed individual is significantly more at risk for developing PTSD. Employment status and type of job/occupation can influence stress and lead to feelings of excessive fear and insecurity (Sakuma et al., 2015). A person who works is less likely to develop PTSD than someone who does not work (Li et al., 2020). Studies conducted by Wang, Xu, & Lu (2020) and Blanc, Rahill, Laconi, & Mouchenik (2016) state that a person's employment status is a risk factor for developing PTSD. This study's findings are also in line with those of Bromet et al (2016), who found that job/occupation is a risk factor for PTSD. The nature of one's job/occupation is also a risk factor for developing PTSD (Ma, Chang, Wu, & Lin, 2020).

Another finding from this study indicates that most of those who experience PTSD are women who earn less than the standard minimum wage. This result is consistent with the findings of Anam, Martiningsih, & Ilus (2016), who concluded that socioeconomic factors are critical risk factors. Economic factors are somewhat difficult to discuss in several studies because the results are typically consistent (homogeneous); however, most studies indicate that low income is a risk factor for psychosocial morbidity. Low income is the initial

trigger for the emergence of mental burden, which results in psychosocial morbidity. Income is a factor in developing PTSD. Individuals with low income have minimal opportunities and thus become easily worried when faced with a disaster, leading to PTSD disorders (Ando et al., 2017).

CONCLUSION

The majority of respondents had severe PTSD. Most of those who experience PTSD are elderly, have low education, are unemployed, and have low income. This situation clearly necessitates additional attention from the local government or other institutions dealing with post-disaster psychosocial issues.

CONFLICT OF INTEREST

The authors states that there is no conflict of interest in this study.

AUTHOR CONTRIBUTIONS

Each researcher contributed to the study's compilation and refinement of the theoretical frameworks. Mrs. CUW provided technical guidance for this study. Mrs. AHH provided statistical guidance during the analysis. All researchers read and approved the final manuscript.

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