

# The Mental Health Level of Flood Victims and Relationship with Disaster Impact in Sri Medan Batu Pahat Johor, Malaysia

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## Abstract

Among the impacts caused by natural disasters is the increase in the mental health level of the people affected by the disaster. If it is allowed to drag on, it may interfere with their survival process. For example, the flood disaster that occurred in Sri Medan subdistrict, Batu Pahat Johor 2023, is suspected to have increased the mental health of the people affected by the disaster so efforts are needed to deal with it. This study aims to find out the mental health level of flood victims after the disaster and the correlation (relationship) between the mental health level of victims and the flood disaster that occurred in Sri Medan subdistrict, Batu Pahat. The population of respondents in this study is the community that became flood victims in the Sri Medan subdistrict, Batu Pahat. The sample taken was 207 respondents using a non-probability sampling technique, namely accidental sampling. Data collection was done through a survey using a questionnaire of 207 respondents who were spread out in the area of the Sri Medan subdistrict. Data analysis was done using a chi-square test and descriptive analysis. The results of the study show that the majority of the community's mental health level after the flood disaster is high with an overall mean of 3.67 and there is a significant correlation ( $p < 0.05$ ;  $r = 0.583$ ) between the mental health level and the impact of floods to the community that became flood victims in Sri Medan subdistrict.

**Keywords:** Mental Health Level, Sri Medan Subdistrict, Batu Pahat, Flood Disaster, Disaster Impact

## Introduction and Background

A disaster is defined as an incident that occurs suddenly, is complex in nature, results in loss of life, damage to property or the environment, and affects the daily activities of the local community. Disaster management requires managing resources, equipment, and manpower coordination over a long period of time. This is because disaster incidents have physical and psychological effects on victims (Noremy, 2020; Che Su et al., 2018). Malaysia is one of the

countries that experience floods every year. This flood phenomenon occurs because of natural factors and uncontrolled development. The simultaneous northeast monsoon and southwest monsoon, which occur between October and March, May and September affect monsoon floods in Malaysia. Heavy rains and floods are caused by several monsoon seasons in Malaysia. At the beginning of 2023, there have been major floods in Sabah, Sarawak, and several states in peninsular Malaysia, starting at the end of February until March. This disaster occurred following continuous heavy rains that started on February 26 which resulted in floods in several states (Manzor, 2023). The state worst affected by floods is Johor. In the State of Johor, there are several areas severely affected by floods including Johor Bahru, Segamat, Kluang, Kota Tinggi, and Batu Pahat (Mohamed Farid Noh, 2023). Batu Pahat district officer (Nasri Md Ali) said that the flood that hit Johor in March 2023 was one of the worst floods after the big flood of 2006. The number of victims affected by the flood at that time involved 40,746 residents from 11,464 families in 136 temporary evacuation centers in 4 affected districts. Batu Pahat recorded the largest number of flood victims with a total of 39,301 out of 10,963 families in 112 Temporary Evacuation Centers (PPS). (Mohamed Farid Noh, 2023). But the worst is the Sri Medan subdistrict area as stated by Omar Ahmad in the daily news that the flood situation in Sri Medan and Parit Sulong is considered the worst which may take several months to recede. In their survey of the location of the incident, they found that the village that has more than 20 clusters of villages in it is like being in a river. Residents' houses were submerged with a water level depth of 2 meters, public facilities and facilities such as temples, mosques, neat kindergartens, and sports centers were also submerged. In addition, more than 100 vehicles, including motorcycles and cars, were also found to be flooded.

Member of the State Legislative Assembly of Sri Medan (ADUN), Datuk Zulkarnain Kamisan said that the relatively low position of the Sri Medan area makes it like a water reservoir area besides that it is close to the Sembrong dam, the Bekok dam, and the Lenik Chaah River (Omar Ahmad, 2023). He also added that in addition to flooded houses, there was also damage and destruction to oil palm plantations and business premises. The residents also lost their income and livelihood, usually the flood was no more than knee level but this time the flood submerged the roof of the house. The feeling of residents are very gloomy, sad because almost 90% of their homes were damaged, furniture and clothes were also destroyed. The emotional and mental health of the residents is at a low level and is affected when their homes and surroundings are damaged and filled with thick mud. Almost 50,000 residents of Batu Pahat became victims of floods, especially in Sri Medan and Parit Sulong areas. (Mohamed Farid Noh, 2023). The physical health of the flood victims was certainly affected at that time, especially the mental health of the victims. Natural disasters such as floods can cause anxiety, fear, stress, trauma, depression, and the like. Floods can have significant long-term effects on the well-being, relationships, and physical and mental health of affected victims. The impact of natural disasters on mental health is complex and multidimensional. Studies show that various psychological problems, such as anxiety, depression, post-traumatic stress disorder (PTSD), and other mental illnesses, are often experienced by flood victims. The mental health of flood victims can vary significantly based on the circumstances of the individual and their loved ones. However, it is common for flood victims to experience levels of post-event stress, anxiety, and depression. Moving from one's own home to another place, loss of possessions, and disruption of daily routine contribute to

mental stress. Symptoms of post-traumatic stress disorder (PTSD) may also occur, nightmares, and hypervigilance.

Boe, Holgersen, and Holen (2011) conducted a study 27 years after the drilling disaster in the North Sea (The North Sea oil rig), it was found that 6.1% of the survivors suffered from PTSD (Post Traumatic Stress Disorder) and 3 times higher risk of mental disorders. In a study 20 years after the earthquake in Armenia, it was found that many children and adolescents experience anxiety, PTSD, and depression. Anxiety disorders are the most common in these survivors compared to PTSD and depression (Najarian, L.M., Sunday, S. Labruna, 2011). A study 1 year after the large forest fire disaster in Greece with student study subjects aged 9 to 18 years found a PTSD rate of 45% and anxiety of 32% (Kolaitis, 2011). Anxiety can happen to everyone and can change their life for the worse. The high frequency of disasters can cause anxiety, fear, damage, and material and non-material losses. Ratih (2007) states that disasters can cause victims to feel anxious, lose their position, shock, depression, psychological stress, and trauma. This opinion is supported by Mudjiran (2010) who states that a disaster can cause a person psychological turmoil, depression, stress, trauma and affect mental health, especially in children. Other sources mention that the post-disaster has caused mental health problems, including depression, anxiety, stress, and somatization. (Diaz, J. O. P., Murthy, S., & Lakshminarayana, R. 2006). Diah (2012) stated that natural disasters and social disasters such as fires, earthquakes, floods, and riots can increase the risk of mental health disorders. If this condition is allowed to drag on, it can cause PTSD which lasts up to 30 years (Sunardi, 2007), even according to Rice and Fahrudin (in Sunardi, 2007) it can last a lifetime.

This post-disaster mental health problem needs to be looked at comprehensively and needs to be managed. If not, this will have a bad impact on all aspects of the community's well-being. Society can lose the passion for life, lose the spirit of work, the children will lose the spirit of life, despair, and in the end, they will become a generation that becomes a burden to the community (Mudjiran, 2010). Improving the mental health of the community when facing calamities and disasters can threaten the well-being of the community in the long term. Therefore, this study is needed to clearly know the relationship between the mental health level of flood victims and being affected by disasters. Besides that, this study aims to fill the void in the literature by examining the mental health level of flood victims in Sri Medan subdistrict, Batu Pahat, and Johor, based on the disaster that befell them. By analyzing the extent of the flood disaster and its relationship with the victim's mental health, this study seeks to provide valuable insight into the impact of floods on individuals in this area, especially the psychological aspect. The findings of this study will contribute to the development of evidence-based interventions and the support of authorities to help flood victims in their recovery process. This study presents a comprehensive analysis of the data collected, highlighting the correlation between the level of flood impact and the mental health of affected individuals.

## **Participants and Methods**

### *Study area*

The researcher has chosen the city of Batu Pahat, more specifically in Sri Medan subdistrict, which is located in Batu Pahat District, Johor (Figure 1). Sri Medan subdistrict and Parit Sulong have received immediate attention from all Malaysians due to the impact of the severe scale of destruction during the flood of March 2023. The evacuation center for flood victims was

almost paralyzed due to the rise of water up to the level of the roofs of houses so almost 50,000 Batu Pahat residents became flood victims, especially in the Sri Medan area. Sri Medan subdistrict has received a high impact of destruction of property (total loss) due to the high-water level almost 90% of their homes were damaged, furniture, oil palm plantations, and clothes were also destroyed (Mohamed Farid Noh, 2023). Sri Medan subdistrict was selected as the main area for this study due to the scale of the flood which was very terrible and caused panic when the area with more than 20 clusters of villages in it was like being in a river, the houses of the residents were submerged with a water level depth of 2 meters (Omar Ahmad, 2023), in addition to the destruction in the Sri Medan sub-district which has been hit by a very serious flood due to the relatively low position of the Sri Medan area making it like a water reservoir area in addition to being close to the Sembrong dam, the Bekok dam, and the Lenik Chaah river (Omar Ahmad, 2023).

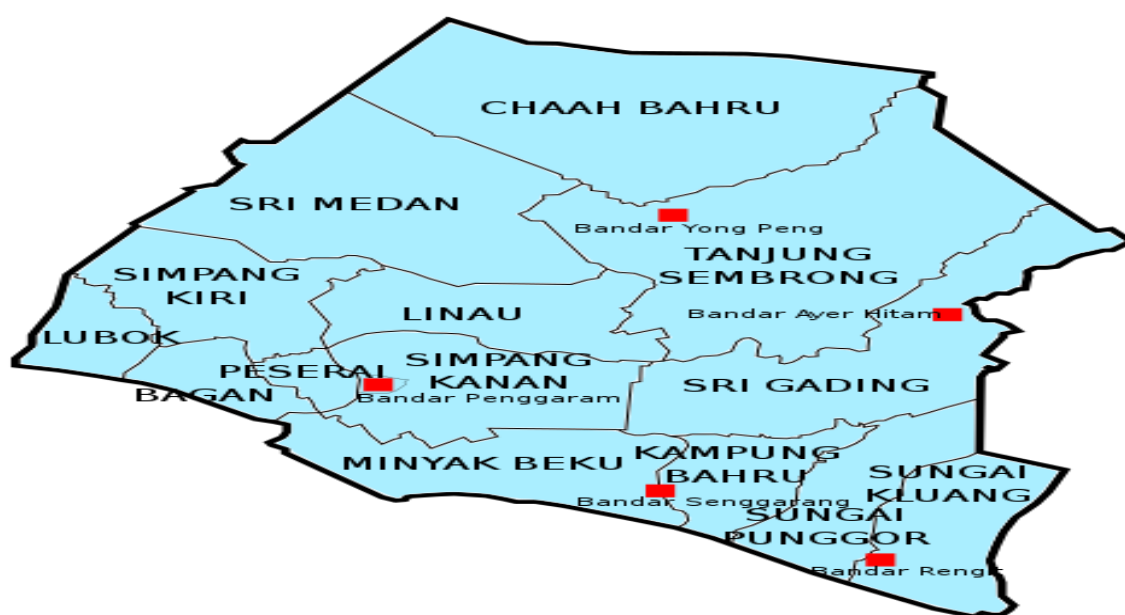


Figure 1 : Map of Batu Pahat District, Johor

### *Study Design*

A quantitative approach has been used throughout this study by using a questionnaire to the head of the household. The observation method was also used by the researcher in this study to see, listen, record, and observe the actions and behavior of the respondents. In addition, this study process is divided into four parts, namely preliminary study, field study, data analysis, and article writing.

### *Sample Size*

The total population in the Sri Medan subdistrict is 26,319 people (JPM Batu Pahat, 2023). A sample size of 207 people was selected based on the table recommendations by Krejcie and Morgan (1970). Sampling for this study is by using the purposive method. The researcher has determined the study area and the respondents in this study are individuals who were severely affected by the flood. This study involves only heads of households who are aged from 20 to 60 years and above and the selection criteria of respondents are based on consideration as individuals who are responsible for managing household matters during the flood disaster and also the post-flood period.

### *Questionnaire*

In order to collect primary data, the researchers used a questionnaire that was distributed to 207 heads of households in the Sri Medan subdistrict. The construction of this questionnaire is based on the arguments of the literature review, and secondary data such as reports, articles, journals, and books in libraries and websites. This study was conducted at the beginning of April 2023 and took five months to collect the data in its entirety. Before that, the researchers first conducted an assessment of the residents of the Sri Medan subdistrict to test the appropriateness and effectiveness of the question items that were developed. The researchers selected 30 heads of households to answer this assessment at the end of March 2023. The questionnaire contained questions about the respondent's profile, the impact of disasters that affected post-disaster flood victims, the level of mental disorder of post-disaster flood victims, and the relationship between the level of mental disorder of flood victims with the flood disaster. This analysis uses closed questions (close-ended) that is, the researcher has prepared answer options to be marked by the respondents and the Likert scale has five options, in the part affected by the calamity that struck the post-disaster flood victims there are five scales, namely scale 1 represents very mild, scale 2 mild, scale 3 moderate, scale 4 represents heavy and scale 5 represents very heavy. In the section on the level of mental disorder of post-disaster flood victims, there are five scales, namely scale 1 representing very small, scale 2 small, scale 3 medium, scale 4 representing large, and scale 5 representing very large. Next, the frequency of the Likert scale is used to determine the interpretation of the mean score as presented by Nunnally and Bernstein (1994). A mean score of 1.00 to 2.00 is low, 2.01 to 3.00 is moderately low, a mean score of 3.01 to 4.00 is high and a mean score of 4.10 to 5.00 is very high. Data collection of this questionnaire using the "face to face interview" method and the researcher helped fill out the questionnaire for some respondents because many respondents did not understand and some even refused to fill it out themselves.

### *Data Analysis*

In order to analyze the study data, the researcher used the correlation descriptive method. This study is a correlational study because the correlational study aims to find out the closeness of the relationship between the variables being studied without making an intervention on the variation of the variables concerned. The data collection technique is a questionnaire. The determination of the total sample of 207 respondents was obtained by using the following formulation: A questionnaire on the level of mental disorder of post-disaster flood victims, affected by disasters that hit post-disaster flood victims using a Likert scale. The questionnaire used has been tested for validity and reliability using the Pearson product-moment formula. Using a computer program or SPSS. The smallest calculated r value (0.322) and the largest calculated r value (0.750), along with an r table value (0.231), indicate that all items in this questionnaire are valid. The reliability data obtained yields the highest alpha value (0.801) and the smallest alpha value (0.742), demonstrating that all items in this questionnaire are considered reliable since the alpha value  $\geq 0.6$ . There are two analyzes that the reviewer uses, namely univariate analysis to determine the respondent's profile, the stage of mental disorder of flood victims, and the impact of the disaster that struck. Bivariate analysis to determine whether there is a relationship between the impact of disasters and the stage of mental disorders of post-disaster flood victims.



## Results of Study and Discussion

### *Respondent Demographics*

Table 1 shows the demographics of respondents in the study area, namely 207 people. The results of the study found that the participation of male respondents was more, as many as 61.4 percent (127 people) compared to 80 female respondents (38.6 percent). The age group that recorded the highest participation was those aged 20 - 29 Years which are 67 people (32.4 percent), followed by 30 – 39 Years with a total of 54 people (26.1 percent). It was found that the majority of residents in the Sri Medan subdistrict area work in the private sector, which is 30.9 percent (64 households). While 29.5 percent (61 respondents) work in the government sector. Next, a total of 40 respondents (19.3 percent) are freelance, a total of 32 households (15.5 percent) are unemployed, and there are 10 respondents who have pensions (4.8 percent). The majority of respondents in the study area have a relatively high level of education. Respondents who completed their studies at the primary school level amounted to 3.4 percent (7 respondents), while at the LCE/SRP/PMR level there were 6 respondents (2.9 percent). At the MCE/SPM/STPM level 6.8 percent (14 respondents), at the Diploma/Degree level 54.6 percent (113 respondents), at the Master/Doctor of Philosophy level 55 respondents (26.6 percent). Meanwhile, respondents who did not finish school were 3.9 percent (8 people) and there were 4 respondents who did not go to school (1.9 percent).

| Respondent Background | Information                 | Frequency | Percentage |
|-----------------------|-----------------------------|-----------|------------|
| Gender                | Male                        | 127       | 61.4%      |
|                       | Female                      | 80        | 38.6%      |
| Age                   | 20 – 29 Year                | 67        | 32.4%      |
|                       | 30 – 39 Year                | 54        | 26.1%      |
|                       | 40 – 49 Year                | 37        | 17.9%      |
|                       | 50 – 59 Year                | 28        | 13.5%      |
|                       | >60 Year                    | 21        | 10.1%      |
| Occupation            | Pension                     | 10        | 4.8%       |
|                       | Private                     | 64        | 30.9%      |
|                       | Government                  | 61        | 29.5%      |
|                       | Unemployment                | 32        | 15.5%      |
|                       | Freelance                   | 40        | 19.3%      |
| Educational level     | Does not go to school       | 4         | 1.9%       |
|                       | Primary School              | 7         | 3.4%       |
|                       | LCE/SRP/PMR                 | 6         | 2.9%       |
|                       | MCE/SPM/STPM                | 14        | 6.8%       |
|                       | Diploma/Degree              | 113       | 54.6%      |
|                       | Master/Doctor of Philosophy | 55        | 26.6%      |
|                       | Didn't Finish School        | 8         | 3.9%       |

### *Impact to the Disaster that Hit Victims of Post-Disaster Floods*

Table 2 shows the impact of the disaster that hit the victim was 49.8% severe and 23.7% moderate. The impact of this disaster shows the high level of environmental damage caused by the flood disaster. Such as residences, palm oil fields, houses of worship, schools, and public facilities. This is appropriate with what was stated by the member of the State Legislative Assembly of Sri Medan, Datuk Zulkarnain Kamisan, who said that almost 90% of

the residents' residences were damaged, farms, furniture, and clothes were also destroyed (Mohamed Farid Noh, 2023).

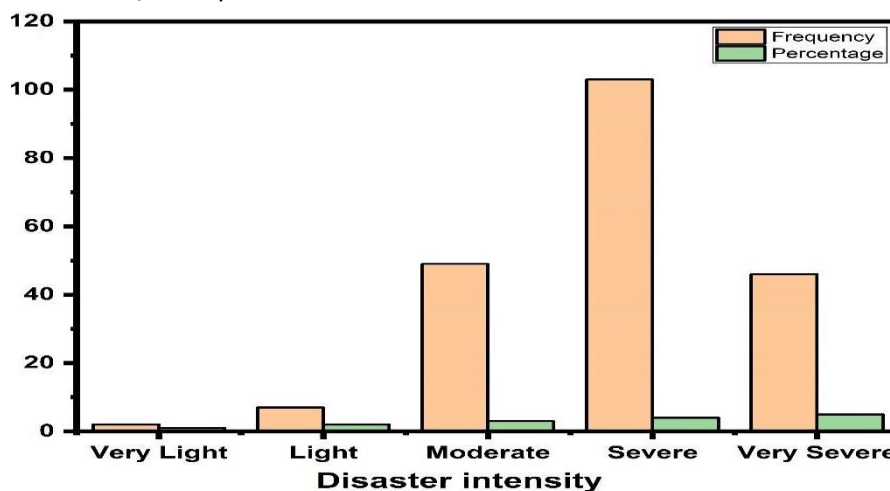


Table 2

The Impact of the Disaster that Struck the Flood Victims in the Post-Disaster Period

| Disaster Intensity | Frequency | Percentage |
|--------------------|-----------|------------|
| Very Light         | 2         | 1.0%       |
| Light              | 7         | 3.4%       |
| Moderate           | 49        | 23.7%      |
| Severe             | 103       | 49.8%      |
| Very Severe        | 46        | 22.2%      |

Post-Disaster Flood Victim Mental Disorder Stage

Table 3 gives an overview of the level of mental disorder experienced by post-disaster flood victims, the majority of the level of disorder is high. A survey shows that, after a disaster event, the majority of disaster victims still have normal psychological reactions, around 15-20% will experience mild or moderate mental disorders that refer to PTSD conditions, while 3-4% will experience severe disorders such as psychosis, severe depression, and high anxiety (WHO, 2013). Flood disasters that occur have an impact on the mental health of victims, especially on their emotional or psychological aspects. The psychological effects received are different for each individual according to differences in age, gender, place or region (Nasir and Zamani, 2012). The effects of disasters according to Norris (2005) include depression, anxiety, delirium, panic, and health problems. Most flood victims experience distress because they feel threatened, worried, and sad about the loss that has befallen themselves and their families as well as other problems such as lack of basic necessities such as shelter, food, drinks, and so on. The results of the study show that flood victims go through bad experiences that can be seen from several aspects. The majority of victims' complaints are loss of property and physical disorder. However, most victims also feel emotional or mental health issues such as feeling anxious, afraid and the trauma of the flood disaster will repeat itself and tired because of cleaning the house or repair work, sad about the loss of possessions and some even have trouble sleeping because they imagine too much. Imagine thinking about a disaster happening. Victims also experience feelings of unease and worry every time it rains and the water level starts to rise. They are worried that there will be another big flood and their lives will be disrupted. This situation clearly shows that the flood disaster that occurred in March 2023 in the Sri Medan subdistrict caused them to feel anxious and afraid with a mean value

(3.85). In addition, the victim was also sad which lasted with a mean value (3.96), how could it not be, that the victim had a lot of loss and damage during the flood. Sadness is an emotional element felt by the victim and needs to be taken into account, otherwise, it will become a long-lasting illness. This is in line with the views of Ahern, Kovats, Wilkinson, Few, and Matthies (2005) who state that the feeling of trembling and restlessness cannot be avoided by the souls who are victims, especially individuals who suffer from severe physical illness or even trauma when faced with the situation certain. Trauma or PTSD is an emotional response to a shocking or sad situation and further trauma can cause anxiety among flood victims (Carrol et al., 2010). Due to the incident, flood victims sometimes find it difficult to sleep at night if it rains heavily. Flood victims also felt anxiety even among them wanting to move to a safer place. However, that wish had to be forgotten because it was difficult to get out of the water siege unless there was help from the government to transport their migration from one point to another.

Table 3  
*Stages of Mental Disorder in Post-Disaster Flood Victims*

| No           | Items      | N (%)     |           |           |           |            | Mean        | Std.v | Stages      |
|--------------|------------|-----------|-----------|-----------|-----------|------------|-------------|-------|-------------|
|              |            | VerySmall | Small     | Moderate  | Large     | Very Large |             |       |             |
| 1            | Anxiety    | 2 (1.0)   | 17 (8.2)  | 51 (24.6) | 78 (37.7) | 59 (28.5)  | 3.85        | .963  | High        |
| 2            | Stress     | 3 (1.4)   | 26 (12.6) | 50 (24.2) | 82 (39.6) | 46 (22.2)  | 3.69        | 1.001 | High        |
| 3            | Sadness    | 6 (2.9)   | 8 (3.9)   | 43 (20.8) | 81 (39.1) | 69 (33.3)  | 3.96        | .980  | High        |
| 4            | Depression | 7 (3.4)   | 16 (7.7)  | 55 (26.6) | 85 (41.1) | 44 (21.3)  | 3.69        | 1.001 | High        |
| 5            | Trauma     | 15 (7.2)  | 37 (17.9) | 65 (31.4) | 52 (25.1) | 38 (18.4)  | 3.29        | 1.172 | High        |
| 6            | Insomnia   | 12 (5.8)  | 28 (13.5) | 53 (25.6) | 62 (30.0) | 52 (25.1)  | 3.55        | 1.173 | High        |
| <b>Total</b> |            |           |           |           |           |            | <b>3.67</b> |       | <b>High</b> |

The relationship between the mental health level of flood victims and post-disaster flood impact

#### *A. Relationship between Anxiety Levels and Flood Impact among Flood Victims*

Based on the results of the value study ( $p < 0.000$ ), if the test value is  $p < 0.05$  then it can be concluded that there is a correlation or relationship between the level of emergency and impact to floods in flood victims in Sri Medan subdistrict. The result of calculating the correlation value of  $r$  is (0.578). This shows that the relationship between the variables is very strong. The direction of the correlation on this result is positive (+) which means that when the disaster becomes more severe, the level of emergency will be higher. Why is that so? According to Stuart (1998) the reason is the loss, that is the loss of property and life when a disaster occurs. study in Japan after the Fukushima nuclear reactor leak and the large earthquake in Eastern Japan showed that the high level of anxiety among respondents was due to both disasters (Fukasawa et al., 2017). Even the post-earthquake study of Nepal showed the highest score four months after the earthquake in Nepal, one in three adults experienced depression and a depressing level of anger (Kane et al., 2018). After two San Bernardino National Forest fires occurred east of Los Angeles, California, the level of anxiety increased due to these incidents (Scher & Ellwanger, 2009). In the study of Dhian Ririn Lestari, et al, 2021 in the Banjar Regency of South Kalimantan, it was found that 10 people (9.26%)



out of 108 respondents had anxiety problems in post-disaster flood victims, that is, 7 people had mild anxiety, 1 person had severe anxiety and 2 people had very severe anxiety. This shows that disasters can increase a person's anxiety. The same is the case with this flood disaster in Sri Medan subdistrict, Batu Pahat. According to respondents, it was the worst in the history of flooding in Batu Pahat after the 2006 flood. The atmosphere at that time was very terrifying, the water overflowed when the sun set and got higher and higher, almost as high as two meters. The flood water brought thick mud to the houses of the residents. This causes high anxiety if it is prolonged as Zakiah Darajat said that the cause of high anxiety is feeling anxious due to danger that threatens oneself and fear (Rochman, 2010).

Table 4

*Relationship between Anxiety Levels and Flood impact among Flood Victims (n=207)*

| Anxiety Levels | Impact Of The Disaster |             |               |              |              |             | Value r | Value P |
|----------------|------------------------|-------------|---------------|--------------|--------------|-------------|---------|---------|
|                | VL                     | L           | M             | S            | VS           | Total       |         |         |
| Very Small     | 1<br>(0.5)             | 0<br>(0.0)  | 1<br>(0.5)    | 0<br>(0.0)   | 0<br>(0.0)   | 2<br>(0.10) | 0.576   | 0.000   |
| Small          | 1<br>(0.5)             | 3<br>(1.44) | 8<br>(3.9)    | 5 (2.42)     | 0<br>(0.0)   | 17 (8.21)   |         |         |
| Moderate       | 0<br>(0.0)             | 2<br>(0.10) | 21<br>(10.14) | 25<br>(12.1) | 3 (1.44)     | 51 (24.6)   |         |         |
| Large          | 0<br>(0.0)             | 0<br>(0.0)  | 16<br>(7.72)  | 51<br>(24.6) | 11<br>(5.31) | 78 (37.7)   |         |         |
| Very Large     | 0<br>(0.0)             | 0<br>(0.0)  | 5<br>(2.42)   | 22<br>(10.6) | 32<br>(15.5) | 59 (28.5)   |         |         |

#### *B. Relationship between Stress Levels and Flood Impact among Flood Victims*

The results of the study show that the value ( $p = 0.000$ ), it can be said that there is a relationship between the level of stress of the victim and the impact of the flood. The value of  $r$  is (0.534), which shows that the relationship between the two is very strong. The direction of the correlation is positive (+) which means that when the disaster becomes more severe, the victim's stress level will be higher. This is because the victims experienced the destruction of their homes, loss of jobs, and the destruction of places of employment such as shops and so on. Stress, anxiety, and depression are the impacts of disasters (Yuner, Sari & Tusadiah, 2018). When a flood or other natural disaster occurs, a person will experience stress and be very sad, causing mental disorders. (Mesuri, Huriani & Sumarsiha, 2014). According to data from the World Health Organization (2020), there are as many as 78.9% of natural disaster victims who experience stress worldwide. In a study (Sherchan et al., 2017) that after a disaster event, there are 15-20% of the population will experience mild or moderate mental disorders that refer to PTSD conditions, while 3-4% will experience severe disorders such as psychosis, severe depression and anxiety the highest. In a study by Dhian Ririn Lestari et al (2021), it was found that the stress condition of victims after the flood disaster in South Kalimantan Banjar Regency was 3.7% (4 people) out of 108 respondents. Another study conducted by (Sharma et al., 2021) found that 20 months after the earthquake in Kathmandu, Nepal, 43.2% of people were depressed and 19.2% stressed out of 125 respondents. study in Thailand conducted by (Thavichachart et al., 2009) stated that stress disorders after the tsunami were found to be 33.6% and depression 14.3%. A study in China of communities that experienced natural disasters showed that severe stress disorders were found as much as 15-29%, this was caused by low education levels, subjective feelings, severe economic status, and mental stress.

Table 5

*Relationship between Stress Levels and Flood impact among Flood Victims (n=207)*

| Stress Levels | Impact Of The Disaster |             |               |              |              |              | Value r | Value P |
|---------------|------------------------|-------------|---------------|--------------|--------------|--------------|---------|---------|
|               | VL                     | L           | M             | S            | VS           | Total        |         |         |
| Very Small    | 2<br>(0.10)            | 0<br>(0.0)  | 1<br>(0.5)    | 0<br>(0.0)   | 0 (0.0)      | 3<br>(1.44)  | 0.534   | 0.000   |
| Small         | 0<br>(0.0)             | 3<br>(1.44) | 11 (5.31)     | 10<br>(4.83) | 2<br>(0.10)  | 26<br>(12.6) |         |         |
| Moderate      | 0<br>(0.0)             | 2<br>(0.10) | 21<br>(10.14) | 24<br>(11.6) | 3<br>(1.44)  | 50<br>(24.2) |         |         |
| Large         | 0<br>(0.0)             | 0<br>(0.0)  | 13<br>(6.3)   | 55<br>(26.6) | 14<br>(6.8)  | 82<br>(39.6) |         |         |
| Very Large    | 0<br>(0.0)             | 0<br>(0.0)  | 5<br>(2.42)   | 14<br>(6.8)  | 27<br>(13.0) | 46<br>(22.2) |         |         |

*C. Relationship between Sadness Levels and Flood Impact in Flood Victims*

The findings of the study show that the value (p 0.000) and the value r count as much as (0.424). This shows that there is a strong relationship between sadness and the impact of the flood that hit the victims, the stronger the impact, the higher the sadness felt. Why is that? Because of the number of damaged houses, schools, places of worship, roads, agricultural land, and so on, some even lost their lives. This will cause huge losses for the population, especially for the economic sector. A large amount of money will be spent on repairs when the tide goes down and the loss of loved ones. According to Elita et al (2017) in their study that victims of natural disasters must feel a lot of loss whether material or otherwise (loss of job, loss of loved ones, disability, and so on), and as a result, the mental health of the victim will be affected. According to Rimayanti (2019), feelings of sadness and trauma occur when a person is faced with a stressful and threatening incident. A variety of natural disaster incidents can cause deep sadness so that victims are not calm, prolonged sadness, fear, and anxiety. Grief is a normal emotional response experienced by a person when experiencing a loss (Strobe, et al 2013; Videbeck, 2008). This is reinforced by the results of study conducted by Lundor, Holmgren, Zachariae, Farver-vestergaard and Connor (2017) who found that out of 853 respondents who were victims of disasters, there were 34.72% of respondents who experienced sadness due to the death of a partner, 27.65% were sad due to the death of parents, 5.08% were saddened by the loss of property and 2.62% were saddened by the loss of livelihood. It can be concluded that the sadness that appears in oneself depends on the closeness of the individual to the lost object, the higher the value of the object, the greater the sense of sadness experienced.

Table 6

*Relationship between Levels of Sadness and Flood Impact on Flood Victims (n=207)*

| Sadness Levels | Impact Of The Disaster |             |              |              |              |               | Value r | Value P |
|----------------|------------------------|-------------|--------------|--------------|--------------|---------------|---------|---------|
|                | VL                     | L           | M            | S            | VS           | Total         |         |         |
| Very Small     | 2<br>(0.10)            | 0<br>(0.0)  | 2<br>(0.10)  | 2<br>(0.10)  | 0<br>(0.0)   | 6<br>(2.9)    | 0.482   | 0.000   |
| Small          | 0<br>(0.0)             | 1<br>(0.5)  | 5<br>(2.42)  | 1<br>(0.5)   | 1<br>(0.5)   | 8<br>(3.9)    |         |         |
| Moderate       | 0<br>(0.0)             | 4<br>(1.93) | 18<br>(8.7)  | 16<br>(7.73) | 5<br>(2.42)  | 43<br>(20.78) |         |         |
| Large          | 0<br>(0.0)             | 0<br>(0.0)  | 17<br>(8.21) | 55<br>(26.6) | 9<br>(4.35)  | 81<br>(39.1)  |         |         |
| Very Large     | 0<br>(0.0)             | 0<br>(0.0)  | 9<br>(4.35)  | 29<br>(14.0) | 31<br>(15.0) | 69<br>(33.3)  |         |         |

*D. Relationship between Depression Levels and Flood Impact on Flood Victims*

The findings of the study show that the value (p 0.000) and the value r count as much as (0.474). This shows that there is a strong relationship between depression and being affected by floods that hit the victim, the stronger the impact, the higher the depression felt by the victim. Why is that many victims died, the destruction of the ecosystem was, many buildings were damaged, the economy was affected, and the level of community well-being decreased (Prudential, 2021). When the mood is disturbed, and a deep feeling of sadness depression appears (Pane, 2020). In a study by Febrianti et al., 2021 it was found that 3-4% of victims suffered from severe depression. study by (Kane et al., 2018) mentions that one in three adults suffered from depression after the earthquake in Nepal, one in five involved alcohols, and one in ten wanted to commit suicide. According to the theory, depression appears as a result of having experienced a terrible and uncontrollable event. These incidents are usually derived from unpleasant and traumatic past experiences such as flood disasters. The condition of people suffering from depression is uncontrolled emotions and the urge to act inappropriately (Pane, 2020). According to others, depression appears because of the loss of daily activities that are usually done so that it can change the feeling of discomfort. After the flood, the economic situation decreased due to damaged buildings, and communication between citizens was difficult. Based on the study of Zang et al (2014) on 2816 earthquake victims who survived it was found that the risk of depression in children and adults is higher compared to others. From the results of the study, it is known that depression in children is 5.8%-54%, the cause is the loss of family, parents, and seeing victims injured and dying in front of their eyes.

Table 7

*Relationship between the Level of Depression and Flood Impact on Flood Victims (n=207)*

| Depression Levels | Impact Of The Disaster |             |              |              |              |              | Value r | Value P |
|-------------------|------------------------|-------------|--------------|--------------|--------------|--------------|---------|---------|
|                   | VL                     | L           | M            | S            | VS           | Total        |         |         |
| Very Small        | 2<br>(0.10)            | 0<br>(0.0)  | 4<br>(1.93)  | 1<br>(0.5)   | 0<br>(0.0)   | 7<br>(3.38)  | 0.474   | 0.000   |
| Small             | 0<br>(0.0)             | 3<br>(1.44) | 6<br>(2.9)   | 6<br>(2.9)   | 1<br>(0.5)   | 16<br>(7.73) |         |         |
| Moderate          | 0<br>(0.0)             | 1<br>(0.5)  | 22<br>(10.6) | 11<br>(5.31) | 10<br>(4.83) | 55<br>(26.6) |         |         |
| Large             | 0<br>(0.0)             | 1<br>(0.5)  | 15<br>(7.24) | 57<br>(27.5) | 12<br>(5.8)  | 85<br>(41.1) |         |         |
| Very Large        | 0<br>(0.0)             | 0<br>(0.0)  | 4<br>(1.93)  | 17<br>(8.21) | 23<br>(11.1) | 44<br>(21.3) |         |         |

*E. Relationship between Trauma Levels and Flood Impact on Flood Victims*

The findings of the study show that the value (p 0.000) and the value r count as much as (0.424). This shows that there is a strong relationship between depression and being affected by floods that hit the victim, the stronger the impact, the higher the level of trauma felt by the victim. Why is it that, trauma occurs due to bitter experiences during disasters, serious illnesses or accidents, the death of loved ones, or witnessing violent incidents (Allen, 2005). According to Laura (2010) one of the mental disorders caused by natural disasters is trauma (PTSD). Disasters can also cause mental disorders such as trauma, depression, and even somatic symptoms that cannot be explained medically (Bromet, 2012). Trauma arises from major natural disasters, environmental conditions change immediately, many victims die, and

body injuries and property destruction (Karanci & Rustemll, 1995). In a study by Kane et al (2018), the highest victims of the earthquake in Nepal were trauma and depression. study by Lu B et al., 2021 mentions that disaster victims experience long-term trauma. Even after 10 years of the Wenchuan earthquake, the residents still suffer from high levels of trauma. The results of this study show that flood disasters can also cause trauma. According to Rufaidah (2009) trauma is one of the factors of anxiety. According to the American Psychiatric Association (2013), trauma is caused by excessive anxiety, fear, and depression. In a study in the Netherlands ten months after the crash of the MH17 plane, this study aimed to see the sense of loss of loved ones in the respondents. The results show that the majority of respondents are mildly stressed, but they are also traumatized (Lenferink et al., 2020). Flooding is one of the natural disasters, flooding in the Sri Medan subdistrict, Batu Pahat with various damages caused can cause trauma among the victims.

Table 8

*Relationship between Trauma Levels and the Impact of Flood Impact on Flood Victims*

| Trauma Levels | Impact Of The Disaster |             |              |              |              |              | Value r | Value P |
|---------------|------------------------|-------------|--------------|--------------|--------------|--------------|---------|---------|
|               | VL                     | L           | M            | S            | VS           | Total        |         |         |
| Very Small    | 1<br>(0.5)             | 1<br>(0.5)  | 7<br>(3.38)  | 4<br>(1.93)  | 2<br>(0.10)  | 15<br>(7.24) | 0.424   | 0.000   |
| Small         | 1<br>(0.5)             | 2<br>(0.10) | 15<br>(7.24) | 17<br>(8.21) | 2<br>(0.10)  | 37<br>(17.9) |         |         |
| Moderate      | 0<br>(0.0)             | 2<br>(0.10) | 17<br>(8.21) | 38<br>(18.4) | 8<br>(3.9)   | 65<br>(31.4) |         |         |
| Large         | 0<br>(0.0)             | 0<br>(0.0)  | 9<br>(4.35)  | 26<br>(12.6) | 17<br>(8.21) | 52<br>(25.1) |         |         |
| Very Large    | 0<br>(0.0)             | 0<br>(0.0)  | 3<br>(1.44)  | 18<br>(8.7)  | 17<br>(8.21) | 38<br>(18.4) |         |         |

*F. Insomnia Levels Relationship with Flood Impact on Flood Victims*

The findings of the study below show that the value (p 0.000) if the test value is  $p < 0.05$  then there is a relationship between insomnia and impact to floods in flood victims. The correlation value of r is (0.353) showing the strong relationship between the two, it can be concluded that the heavier the disaster, the higher the level of insomnia experienced by the victims. Why is that, because the victims witnessed the incident of the disaster in front of their eyes, many families were injured, and many properties were destroyed as well as deep anxiety fearing the disaster would come again so sleep is disturbed and even difficult to sleep. This is in accordance with what was reported by American Psychiatric Association (2013) that the negative response or attitude that is often displayed by individuals during natural disasters is difficulty sleeping (insomnia), feeling sad and depressed, feeling angry, feeling powerless, headache, dizziness, feeling like committing suicide or trying to commit suicide, wanting hurt others, and hurt yourself. One of the symptoms that appear during natural disasters is Hyperarousal Symptoms (increased alertness). Hyperarousal Symptoms generally show symptoms of difficulty falling asleep or maintaining sleep, difficulty concentrating, feelings of excessive caution, feelings of excessive surprise, including increased physiological reactivity, and symptoms of tension (hyperarousal) as a form of symptom PTSD (APA, 2013).

Table 9

*Relationship between Insomnia Levels and the Impact of Flood Impact on Flood Victims*

| Insomnia Levels | Impact Of The Disaster |             |              |              |              |              | Value r | Value P |
|-----------------|------------------------|-------------|--------------|--------------|--------------|--------------|---------|---------|
|                 | VL                     | L           | M            | S            | VS           | Total        |         |         |
| Very Small      | 1<br>(0.5)             | 1<br>(0.5)  | 6<br>(2.9)   | 2<br>(0.10)  | 2<br>(0.10)  | 12<br>(5.8)  | 0.353   | 0.000   |
| Small           | 1<br>(0.5)             | 3<br>(1.45) | 10<br>(4.83) | 13<br>(6.28) | 1<br>(0.5)   | 28<br>(13.5) |         |         |
| Moderate        | 0<br>(0.0)             | 0<br>(0.0)  | 17<br>(8.21) | 24<br>(11.6) | 12<br>(5.8)  | 53<br>(26.0) |         |         |
| Large           | 0<br>(0.0)             | 1<br>(0.5)  | 10<br>(4.83) | 38<br>(18.4) | 13<br>(6.28) | 62<br>(30.1) |         |         |
| Very Large      | 0<br>(0.0)             | 0<br>(0.0)  | 8<br>(3.9)   | 26<br>(12.6) | 18<br>(8.7)  | 52<br>(25.1) |         |         |

Based on the Spearman correlation statistical test conducted to study the relationship between the level of mental stress experienced by flood victims and the occurrence of the disaster they faced, the following results were obtained.

| Statistic test          | p value |
|-------------------------|---------|
| Spearman                | 0.000   |
| Correlation Coefficient | 0.583** |

Statistical analysis shows a significant relationship between the level of mental stress experienced by flood victims and being affected by disasters. A p value of 0.000 indicates that the observed correlation is highly unlikely to occur by chance alone. This finding shows a strong correlation between the investigated variables. Furthermore, the correlation coefficient of 0.583\*\* shows a moderate positive correlation between the level of mental stress and the severity of the disaster. A double asterisk indicates that the correlation coefficient is statistically significant. This implies that, as the severity of the disaster increases, there is a tendency for flood victims to experience higher mental stress. These findings focus on the importance of considering the psychological well-being of flood victims in disaster management and recovery. The results show that as the impact and severity of a disaster increase, there is a greater likelihood of adverse psychological effects on affected individuals. Therefore, interventions and support services targeting mental health should be integrated so that the mental health of victims is not affected and worsened.

### Conclusion

Based on the impact of flood victims in Sri Medan subdistrict, Batu Pahat, Johor to the disaster, it provides valuable insight into the impact of floods on the psychology of victims. The study revealed a clear correlation between the level of mental disorder of the victim and the impact of the disaster. When the impact of a disaster increases, the mental health of the victim is greatly affected. These findings emphasize the importance of addressing the mental health of post-disaster flood victims by providing spiritual support and physical assistance. Mental health services are very important to reduce the emotional and psychological stress experienced by post-flood victims and ensure the resilience and recovery of flood-affected communities in the Sri Medan subdistrict, Batu Pahat, and Johor goes well. Further study is welcome to look at effective mental health development programs for victims. With that, we can use a comprehensive and professional approach to improving mental health recovery efforts for post-flood disaster victims, especially in the Sri Medan subdistrict area, Batu Pahat, Johor. This study contributes theoretically by enhancing knowledge in the field of post-

disaster mental health, particularly in the context of floods in Malaysia, where such research is still limited. Contextually, the findings of this study provide guidance to authorities and organizations involved in disaster management to understand the relationship between the impact of flood disasters and the mental health levels of victims. These findings are significant in supporting the development of more effective psychosocial intervention and support programs, as well as strengthening the recovery efforts of communities affected by disasters, particularly in the Sri Medan area, Batu Pahat.

## References

- Ahern, M., Kovats, R. S., Wilkinson, P., Few, R., & Matthies, F. (2005). Global Health Impacts of Floods: Epidemiologic Evidence. *Epidemiologic Reviews*, 27, 36-46, doi: 10.1093/epirev/mxi004.
- Allen, J.G. (2005). *Coping With Trauma*. Washington DC : American Psychiatric Publishing.
- Bromet, E. J. (2012). Mental Health Consequences of the Chernobyl Disaster. *Journal of Radiological Protection*, 32 (1), N71-5. doi: 10.1088/0952-4746/32/1/N71.
- Boe, H. J., Holgersen, K. H., & Holen, A. (2011). Mental Health Outcomes and Predictors of Chronic Disorders After the North Sea Oil Rig Disaster: 27-Year Longitudinal Follow-up Study. *The Journal of nervous and mental disease*, 199(1), 49-54.
- Carrol, B., Balogh, R., Morbey, H. & Aroaz, G. (2010). Health and Social Impact of Flood Disaster: Responding to Needs and Implications For Practice. *Disasters*, 34(4), 1045-1063. doi: 10.1111/j.1467-7717.2010.01182.x.
- Diaz, J. O. P., Murthy, S., & Lakshminarayana, R. (2006). *Advances in Psychological and Social Support after Disasters*. New Delhi: Voluntary Health Association of India Press.
- Edition, F. (2013). *Diagnostic and Statistical Manual of Mental Disorders*. *Am Psychiatric Assoc*, 21(21), 591-643.
- Elita, Y., Sholihah, A., & Sahiel, S. (2017). Acceptance and Commitment Therapy (ACT) Bagi Penderita Gangguan Stress Pasca Bencana. *Jurnal Konseling dan Pendidikan*, 5 (2), 97-101.
- Febrianti, T., & Nurfadhilah, N. (2021). Faktor Determinan Sosial Dan Gambaran Kejadian Post Traumatic Syndrome Disorder (PTSD) Pasca Banjir di DKI Jakarta Dan Bekasi Tahun 2020. *VISIKES Jurnal Kesehatan*, 20(1), 218-225.
- Fukasawa, M., Kawakami, N., Umeda, M., Miyamoto, K., Akiyama, T., Horikoshi, N., Yasumura, S., Yabe, H., & Bromet, E. J. (2017). *Environmental Radiation Level, Radiation Anxiety, and Psychological Distress of Non-Evacuee Residents in Fukushima Five Years After the Great East Japan Earthquake: Multilevel analyses*. *SSM – Population Health*, 3, 740-748. <https://doi.org/10.1016/j.ssmph.2017.09.002>.
- JPM Batu Pahat, (2023). *Bencana Banjir Batu Pahat: Fakta dan Angka*. Retrieved : 20 Jun 2023, From : [https://www.dosm.gov.my/v1/uploads/files/6\\_Newsletter/Newsletter%202023/DOSM\\_BPPD\\_9\\_2023\\_Series%2020.pdf](https://www.dosm.gov.my/v1/uploads/files/6_Newsletter/Newsletter%202023/DOSM_BPPD_9_2023_Series%2020.pdf).
- Karanci, A. N., Rustemll, A. (1995). *Psychological Consequences of the 1992 Erzincan (Turkey) Earthquake*. *Disasters*, 19 (1), 8-18. <https://doi.org/10.1111/j.1467-7717.1995.tb00328.x>
- Kane, J. C., Luitel, N. P., Jordans, M., Kohrt, B. A., Weissbecker, I., & Tol, W. A. (2018). Mental Health and Psychosocial Problems in the Aftermath of the Nepal Earthquakes: Findings From a Representative Cluster Sample Survey. *Epidemiology and psychiatric sciences*, 27(3), 301–310. <https://doi.org/10.1017/S2045796016001104>.



- King, L. A. (2010). Psikologi Umum: Sebuah Pandangan Apresiatif. *Jakarta: Salemba Humanika*.
- Kolaitis, G. (2011). Posttraumatic Stress Disorder in Children and Adolescents Exposed to Different Traumatic Situations: A Review of Recent Studies. In *European Child and Adolescent Psychiatry* (Vol. 20, No. 1, pp. S75-S75). 233 Spring ST, New York, NY 10013 USA: SPRINGER.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size For Research Scivities. *Educational and Psychological Measurement*, 30(3), 607-610.
- Lenferink, L. I., Nickerson, A., Keijser, J., Smid, G. E., & Boelen, P. A. (2020). Trajectories of Grief, Depression, and Posttraumatic Stress in Disaster-Bereaved People. *Depression and anxiety*, 37(1), 35-44.
- Lestari, D. R., Santi, E., Hilman, M., Pujianor, G. A. R., Norrizqie, M., & Aminullah, M. F. (2021). Kondisi Status Stres Psikososial Pada Warga Pasca Terdampak Banjir Sungai Kiram Kabupaten Banjar Kalimantan Selatan. *Jurnal Ilmu Keperawatan Jiwa*, 4(4), 809-816.
- Lu, B., Zeng, W., Li, Z., & Wen, J. (2021). Risk Factors of Post-Traumatic Stress Disorder 10 Years After Wenchuan Earthquake: A Population-Based Case-Control Study. *Epidemiology and Psychiatric Sciences*, 30, e25. doi:10.1017/S2045796021000123.
- Lundorff, M., Holmgren, H., Zachariae, R., Farver-Vestergaard, I., & O'Connor, M. (2017). Prevalence of Prolonged Grief Disorder in Adult Bereavement: A Systematic Review and Meta-Analysis. *Journal of affective disorders*, 212, 138-149.
- Manzor, Z. (2023). Hujan Berterusan Di Timur Semenanjung, Barat Sarawak dan Timur Sabah. Retrieved : 14/8/2023. From : <https://www.kosmo.com.my/2023/02/23/hujan-berterusan-di-timur-semenanjung-barat-sarawak-dan-timur-sabah/>.
- Mesuri, R.P., Huriani, E., & Sumarsih, G. (2014). Hubungan Mekanisme Koping Dengan Tingkat Stres Pada Pasien Fraktur. *Ners Jurnal Keperawatan*. 10 (1), 66-74.
- Mudjiran, D., & Daharnis, D. (2010). Pemulihan Dini Mental Masyarakat Pasca Gempa di Kota Padang. *Padang: Pemko Padang, BNPB, UNP*.
- Mustaffa, C. S., Marzuki, N. A., Khalid, M. S., Sakdan, M. F., & Sipon, S. (2018). Understanding Malaysian Malays Communication Characteristics in Reducing Psychological Impact on Flood Victims. *Jurnal Komunikasi; Malaysian Journal of Communication*, 34(1), 20-36.
- Najarian, L. M., Sunday, S., Labruna, V., & Barry, I. (2011). Twenty-Year Follow-Up of Adults Traumatized During Childhood in Armenia. *Journal of Affective Disorders*, 135(1-3), 51-55.
- Nasir, R., & Zamani, Z.A. (2012). Kesan Psikologi Ke Atas Penduduk Setempat Akibat Banjir Besar Johor 2006/2007. Dlm: Baharudin, Y., Maimon, A., dan Salmijah, S., ed. 2012. *Banjir Besar Johor*. Bangi: Penerbit UKM. pp. 102-113.
- Noh, M. F. (2023). Johor Mula Dilanda Banjir. Retrieved : 14/8/2023. From : <https://www.bharian.com.my/berita/nasional/2023/03/1070572/johor-mula-dilanda-banjir-1591-mangsa-dipindahkan-di-21-pps>.
- Noh, M. F. (2023). Kemusnahan Akibat Banjir Sri Medan Sangat Luar Biasa. Retrieved : 14/8/2023. From : <https://www.hmetro.com.my/mutakhir/2023/03/947722/kemusnahan-akibat-banjir-di-sri-medan-sangat-luar-biasa>.
- Noh, M.F. (2023). Banjir Di Batu Pahat Mungkin Lepas Ramadan. Retrieved : 14/8/2023. From : [https://www.bharian.com.my/berita/nasional/2023/03/1076348/banjir-di-batu-pahat-mungkin-lepasi-ramadan#google\\_vignette](https://www.bharian.com.my/berita/nasional/2023/03/1076348/banjir-di-batu-pahat-mungkin-lepasi-ramadan#google_vignette).

- Noremy, M. A. (2020). A Review on the Psychological Issues and Psychosocial Intervention: Flood Disasters in Malaysia. *International Journal of Psychosocial Rehabilitation*, 24(4), 4337-4349.
- Norris, F. H. (2005). Range, Magnitude and Duration of the Effects of Disasters on Mental Health. Retrived : 8/8/2023. From : [http://www.redmh.org/research/general/REDMH\\_effects.pdf](http://www.redmh.org/research/general/REDMH_effects.pdf).
- Ahmad, O. (2023). Banjir Termenung Di Sri Medan Berbulan Mahu Surut. Retrieved : 14/8/2023. From : <https://www.bharian.com.my/berita/nasional/2023/03/1073248/banjir-termenung-di-sri-medan-berbulan-mahu-surut>.
- Pane, M. D. C. (2020). *Depresi*. Retrieved : 10/8/2023. From : Alodokter.Com. <https://www.alodokter.com/depresi>.
- Pratiwi, R.P. (2007). *Sumbangan Psikologi Klinis Dalam Assessment Gangguan Psikologis Korban Bencana Alam*. Retrived : 11/8/2023. From <http://psikologi.or.id/>.
- Prudential. (2021). *Dampak Banjir Bagi Masyarakat yang Perlu Diketahui*. Retrieved : 11/8/2023. From : Prudential. <https://www.prudential.co.id/id/pulse/article/5-dampak-banjir-bagi-masyarakat-yang-perlu-diketahui/>.
- Rimayati, E. (2019). Pendekatan Dalam Mereduksi Trauma Masyarakat Pasca Bencana Tsunami di Selat Sunda. *Indonesian Journal of Guidance and Counseling: Theory and Application*. 8(1) : 55-61. DOI : <https://doi.org/10.15294/ijgc.v8i1.28273>.
- Rochman, K. L., & Rohmad. (2010). *Kesehatan Mental*. Stain Purwokerto Press.
- Rufaidah, E. R. (2009). Efektifitas Terapi Kognitif Terhadap Penurunan Tingkat Kecemasan Pada Penderita Asma di Surakarta. *Fak. Psikologi UGM*.
- Scher, C. D., & Ellwanger, J. (2009). Fire-Related Cognitions Moderate the Impact of Risk Factors on Adjustment Following Wildfire Disaster. *Journal of Anxiety Disorders*, 23(7), 891-896.
- Sharma, V., Levin, B. L., Rahill, G. J., Baldwin, J. A., Luitel, A., & Marhefka, S. L. (2021). Post-earthquake Self-Reported Depressive Symptoms and Post-Traumatic Stress Disorder and their Correlates among College-Youths in Kathmandu, Nepal. *The Psychiatric quarterly*, 92(4), 1595–1609. <https://doi.org/10.1007/s1126-021-09928-5>.
- Sherchan, S., Samuel, R., Marahatta, K., Anwar, N., Van Ommeren, M. H., & Ofrin, R. (2017). Post-Disaster Mental Health and Psychosocial Support: Experience From the 2015 Nepal Earthquake. *WHO South-East Asia Journal of Public Health*, 6(1), 22-29.
- Stroebe, M. S., Schut, H. A., & Finkenauer, C. (2001). The Traumatization of Grief? A Conceptual Framework For Understanding the Trauma-Bereavement Interface. *Israel Journal of Psychiatry and Related Sciences*, 38(3-4), 185-201.
- Sunardi. (2007). *Gangguan Stres Pasca Trauma (Post Traumatic Stress Disorder) dalam Perspektif Konseling*. PLB FIP Universitas Pendidikan Indonesia. Bandung.
- Stuart, G. W., & Sundeen, S. J. (2007). *Buku Saku Keperawatan Jiwa (edisi 5)*. Jakarta: Penerbit Buku Kedokteran EGC.
- Thavichachart, N., Tangwongchai, S., Worakul, P., Kanchanatawan, B., Suppavitiporn, S., Pattalung, A. S. N., & Chareonsook, O. (2009). Posttraumatic Mental Health Establishment of the Tsunami Survivors in Thailand. *Clinical Practice and Epidemiology in Mental Health*, 5, 1-9.
- Utami, D.S. (2012). Bencana Alam dan Sosial Tingkatkan Gangguan Jiwa. Retrieved 10 August 2023, from <http://www.tempo.co/read/news/2012/08/31/173426684/Bencana-Alam-dan-Sosial-Tingkatkan-Gangguan-Jiwa>.

- WHO. (2013). Building Back Better. Sustainable Mental Health Care After Emergencies. Geneva: World Health Organization. (2013). Retrieved : 4/8/2023. From : [http://apps.who.int/iris/beatstream/10665/85377/1/978241564571\\_eng.pdf?ua=1](http://apps.who.int/iris/beatstream/10665/85377/1/978241564571_eng.pdf?ua=1)
- WHO. (2020). Natural Disasters. Swiss: World Health Organization. Retrieved : 4/8/2023. From : <https://ourworldindata.org/natural-disasters>.
- Yunere F., Sari, Y.P., & Tusadiah, H. (2018). Hubungan Mekanisme Koping Dengan Resiko Terjadinya Depresi Pada Korban Pasca Bencana Kebakaran Toko Di Pasar Atas Kota Bukittinggi Tahun 2018. *Jurnal Kesehatan Perintis (Perintis's Health Journal)*, 5 (1), 80-86. DOI: <https://doi.org/10.33653/jkp.v5i1.99>
- Zhang, Q., Zhang, J., Jiang, L., Liu, X., & Tong, Z. (2014). Flood Disaster Risk Assessment of Rural Housings - A Case Study of Kouqian Town in China. *International Journal of Environmental Research and Public Health*, 11(4),3787–3802. <https://doi.org/10.3390/ijerph110403787>.