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The psychological impact of exposure to floods among adolescents

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Abstract

Background: Floods are the most common natural disaster in the world, dominating with 163 incidents or 50.77% in 2023. Based on the Indonesian Disaster Index (IDI) data, 8.331 flood disasters occurred in Indonesia from 2014 to 2023. Meanwhile, the National Disaster Management Agency (NDMA) recorded 16 flood incidents in the Bandar Lampung area over the past 10 years. This disaster not only causes damage to infrastructure but also instills anxiety among students, which has the potential to affect their level of preparedness. Therefore, it is very important to understand the relationship between anxiety and the preparedness of adolescents.

Purpose: To determine the psychological impact of flood exposure on adolescents.

Method: A Descriptive Correlational research type with a Cross Sectional approach, employing a quantitative method design with a Descriptive Correlation design. The respondents in this study are students at Junior High School 27 Bandar Lampung with a population of 469 students. The total sample obtained using Proportionate Stratified random sampling technique is 216 respondents.

Results: Out of 87 students with anxiety, there were 78 (89.7%) respondents who were not prepared and 9 (10.3%) respondents who were prepared to face floods. Meanwhile, out of 129 respondents without anxiety, there were 80 (62.0%) respondents who were not prepared and 49 (38.0%) respondents who were prepared to face flood disasters. The chi-square test results showed a p-value of $0.000 < 0.05$.

Conclusion: Adolescence, as a dynamic transitional phase, is a crucial period for developing awareness, resilience, and preparedness in the face of disasters such as floods. Findings indicate a significant relationship between anxiety and preparedness, with adolescents experiencing anxiety being five times more likely to be unprepared than those without anxiety.

Keywords: Adolescents; Anxiety; Preparedness.

INTRODUCTION

Disasters are one of the recurring problems that frequently occur in various parts of the world. A disaster is defined as an event that can cause damage, environmental disruption, loss of human life, and a decline in health quality or health services, which requires intervention from external parties beyond the affected community or region (Philip & Vithya, 2023). Various major disasters often occur, both those caused by natural phenomena and human activities. Natural disasters refer to events triggered by natural activities, such as floods,

landslides, volcanic eruptions, tornadoes, and others (Rahim, Rifai, Soleha, Fauziah, & Syain, 2023). A total of 321 natural disasters occurred worldwide in 2023, affecting 118 countries. Among these disasters, floods were the most frequent, with 163 incidents or 50.77% of the total, followed by storms with 66 incidents (20.56%), earthquakes with 30 incidents (9.34%), droughts with 20 incidents (6.23%), and landslides with 17 incidents (5.29%) (Devi, & Hermawati, 2024). One of the most frequently occurring natural disasters in Indonesia is

flooding. According to the Indonesian Disaster Index (IDI) there were 8.331 flood events in Indonesia between 2014 and 2023. Floods have affected various regions across Indonesian islands, with the most frequent occurrences in Sumatra. Over 113 million people have been impacted, and affected assets exceeded Rp. 900 trillion across 34 provinces (Marlina, 2024). Currently, Bandar Lampung City often experiences seasonal flooding, which occurs almost every year and causes significant losses (Noor, 2018). 16 flood events in Bandar Lampung over the past ten years. More than 14.000 people were affected, over 500 individuals had to be evacuated, more than 900 houses were damaged, and four public facilities were destroyed (Nurpambudi & Aziz, 2022). Based on data collected by the Regional Disaster Management Agency (RDMA) several areas in Bandar Lampung City have a high risk of disasters. These high-risk areas include Bumiwaras, Teluk Betung Selatan, Teluk Betung Timur, Kedamaian, Rajabasa, Sukarame, Sukabumi, and other regions (Septiana, Muda, & Muhammad, 2022). Disasters can have significant impacts on education, damaging various components of schools, including students, and endangering millions of young people. However, these impacts can be minimized by increasing community preparedness in facing disasters (Sarkawi & Fitriani, 2021). Preparedness refers to a series of actions taken to anticipate disasters effectively and efficiently. Communities lacking adequate preparedness tend to experience high levels of anxiety and face difficulties in managing emergency situations (Haristiani, Setioputro, Yunanto, Al Alawi, & Zahra, 2023).

Anxiety is a condition that arises in response to stress, characterized by feelings of tension, worried thoughts, and physical symptoms such as increased heart rate, high blood pressure, and others. Adolescents are particularly vulnerable to anxiety, as they are in a developmental stage and easily influenced by uncertain situations (Yusfarani, 2021). Adolescents play a significant role in emergency response and disaster prevention efforts. Therefore, enhancing disaster education is an important step in preparing the younger generation to face disaster situations. All individuals, including school educators and institutions, need to be equipped with an understanding of disaster preparedness and its

implementation in society. Through this approach, communities will be better prepared when disasters occur. Additionally, this step aims to help students develop preparedness from an early age, especially in dealing with recurring flood threats (Istihora & Basri, 2020).

This phenomenon requires serious attention from local governments and the community, as floods can cause losses to residents, damage infrastructure, and disrupt daily activities. A previous study has been conducted on the relationship between anxiety and adolescent preparedness in facing floods in Samarinda. The results showed that out of 606 respondents in Samarinda, the majority were 17 years or older, with 124 respondents (20.5%) being adolescents. The independent variable, namely anxiety, showed that most respondents had low (47.5%), moderate (60.6%), and high (55.8%) levels of anxiety. The analysis revealed a significant relationship between anxiety and preparedness, with a p-value of $0.037 < 0.05$, indicating that anxiety affects adolescent preparedness in facing floods in Samarinda. According to data obtained from the Bandar Lampung City Education and Culture Office in 2024, there were three junior high schools affected by flooding in Bandar Lampung. A preliminary study conducted at Junior High School 27 Bandar Lampung, based on interviews with the student affairs vice principal, revealed that floods frequently occur at night at this school. Its location near an overflowing river causes the school area to be submerged during floods. Flooding has occurred since 2005 and continues to this day, with the worst flood happening in 2022, reaching waist height. The flood caused significant damage, such as destroyed school walls, damaged books, and impacts on the library, prayer room, and other facilities. In 2024, floods occurred twice, in March and April. These night-time floods caused serious damage to the school environment, property losses, and psychological impacts such as anxiety among students and school staff. The pre-survey conducted on November 19, 2024, at Junior High School 27 Bandar Lampung showed that 33.33% of students experienced no anxiety, 20% experienced extreme anxiety, 13.33% experienced severe anxiety, 20% experienced moderate anxiety, and 13.33% experienced mild anxiety. Regarding preparedness, 60% of students had low preparedness, while 40%

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had moderate preparedness. Further efforts to provide disaster education and preparedness training can be important steps in increasing student preparedness and reducing anxiety in facing potential future disasters.

RESEARCH METHOD

This study employs a quantitative research method to measure or describe events using quantitative data or numerical values that can be statistically analyzed. The research design used in this study is descriptive correlational. A cross-sectional preparedness in facing floods at Junior High School 27 Bandar Lampung. Ethical committee approval was submitted prior to the research activities to the Health Research Ethics Committee of Malahayati University, with approval number 4840/EC/KEP-UNMAL/V/2025, issued on May 27, 2025.

The research was conducted at Junior High School 27 Bandar Lampung from May 28 to June 5, 2025. The population includes all seventh- and eighth-grade students at Junior High School 27, totaling 469 students. The minimum required sample size for this study is 216 students. The independent variable in this study is adolescent anxiety, and the dependent variable is adolescent preparedness in

facing floods. Data analysis will be conducted using frequency distribution analysis and Chi-square analysis. Respondents experiencing anxiety can be classified into two categories based on questionnaire scores. Moderate anxiety is characterized by excessive worry, difficulty concentrating, and sleep disturbances, with scores ranging from 14–27 on the Hamilton Anxiety Rating Scale (HARS) or 10–14 on the Generalized Anxiety Disorder Scale (GAD-7). Meanwhile, heavy anxiety is marked by more prominent symptoms such as palpitations, muscle tension, excessive fear, and avoidance behavior, with scores of ≥ 28 on HARS or ≥ 15 on GAD-7. Respondents' disaster preparedness was classified into two categories. Prepared respondents demonstrated adequate knowledge of disaster risks, familiarity with evacuation routes, availability of emergency supplies, and participation in preparedness activities or training, indicating readiness to act effectively in an emergency. Conversely, unprepared respondents demonstrated limited awareness of disaster risks, lack of knowledge of evacuation procedures, lack of emergency supplies, and minimal or no involvement in disaster preparedness efforts, reflecting a lack of preparedness for potential disasters.

RESEARCH RESULTS

Table Characteristics of Respondents (N=216)

Variable	Results	p-value	OR (95%)
Age (Mean$\pm$SD)(Range)(Year)(n/%)	(13.7 $\pm$ 0.8)(12-15)		
Gender			
Female	112/51.9		
Male	108/48.1		
Anxiety			
Moderate	87/40.3		
Heavy	129/59.7		
		0.000	5.308 (2.443-11.536)
Preparedness			
Not Prepared	158/73.1		
Prepared	58/26.9		

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The respondents had a mean age of 13.7 ± 0.8 years with an age range of 12–15 years. In terms of gender distribution, females accounted for 51.9% and males for 48.1% of the sample. Most respondents experienced moderate anxiety, namely 129 respondents (59.7%). Concerning preparedness, the majority of respondents (73.1%) were prepared, whereas 26.9% were not. Based on the Chi-square test results, a p-value of $0.000 < 0.05$ was obtained, indicating that there is a significant relationship between anxiety and adolescent preparedness in facing floods. The odds ratio value is 5.308, which means that adolescents who experience anxiety are 5 times more likely to be unprepared for flood disasters.

DISCUSSION

Adolescence is a transitional phase from childhood to adulthood, marked by biological, psychological, moral, and spiritual development (Rahmawaty & Zulkifli, 2021). Adolescents are categorized as individuals aged 10 up to, but not yet, 18 years old. Adolescent health programs aim to prepare youth to become healthy, intelligent, high-quality, and productive adults who actively participate in maintaining, sustaining, and improving their own health (Mishra & Suar, 2022). The results of this study are consistent with previous research showing that of the 244 respondents, the majority were teenagers aged 13 years (92 respondents or 15.2%), 14 years (107 respondents or 17.7%), 15 years (113 respondents or 18.6%), and 16 years (96 respondents or 15.8%). In addition, there were 124 respondents (20.5%) surveyed in 2017. Of these respondents, the majority were female, namely 346 (67.1%), while 260 (42.9%) were male (Selvyana & Fitriani, 2021). Adolescence is the most dynamic phase of a person's life, beginning at the age of 10 and lasting until 18. It is during this time that individuals begin to truly understand themselves. This phase is not only marked by physical changes but also by the development of complex thoughts and emotions. Adolescence is a period full of challenges, but also rich with opportunities. When navigated with awareness, support, and proper guidance, it can serve as a springboard toward a more mature and meaningful life.

Anxiety as feelings of discomfort, nervousness, or worry about something that is happening or might

happen in the future. Anxiety is a mental state that can occur normally and is found across all human cultures and certain animals. Emotional disorders, such as anxiety or depression, are among the most common medical and public health issues. Anxiety is an emotional state arising from feelings of discomfort experienced by an individual and is characterized by vague feelings accompanied by helplessness and uncertainty caused by unclear or potential future events (Ramie, 2022). These results are in accordance with other studies which show that most respondents experienced moderate anxiety (435 respondents, 71.9%), followed by low anxiety (118 respondents, 19.5%), and high anxiety (52 respondents, 8.6%) (Sari, Neherta, & Fajria, 2020). The majority of respondents did not feel anxious because they had no prior negative experiences; specifically, they had never experienced flooding disasters before and thus did not feel anxious. Anxiety is the body's natural response to stress. It functions like an alarm, warning that something needs to be faced or prepared for. In moderate amounts, anxiety can be beneficial by encouraging greater alertness, preparedness, and caution. However, excessive and persistent anxiety can disrupt life, causing individuals to fear trying new things, withdraw socially, or feel depressed despite the absence of real threats.

Preparedness is a series of actions taken to anticipate disasters through organizing and implementing effective and efficient measures. Preparedness can also be defined as a state of readiness in facing a crisis, disaster, or other emergency (Anitasari, 2024). It involves planning responses in the event of a disaster. Each authority has different responsibilities and must cooperate to achieve comprehensive preparedness. Every institution and community has roles in disaster management and must prepare to respond quickly and appropriately (Sakdiah Halimatun, 2022). The findings of this study align with previous research showing that of 606 respondents, 349 (57.6%) were prepared, while 257 (42.3%) were not (Selvyana & Fitriani, 2021). The majority of respondents were unprepared for flood disasters due to a lack of knowledge regarding proper flood response procedures. Flood preparedness among adolescents encompasses the skills, knowledge, and attitudes to understand flood risks and take anticipatory and

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responsive measures before, during, and after a flood event. Preparedness encompasses hazard awareness, emergency response skills, and concern for oneself, family, and the surrounding environment. Environmental awareness and social responsibility are crucial. If adolescents are trained and given the opportunity to participate in disaster management, they will grow into a more caring, resilient generation, and prepared to face future challenges.

Based on the chi-square test results, a p-value of $0.000 < 0.05$ was obtained, indicating a significant relationship between anxiety and adolescent preparedness in facing floods. The odds ratio (OR) was 5.308, meaning adolescents with anxiety have five times the risk of being unprepared to face flooding disasters. Preparedness aims to reduce the impact of hazards through effective, timely, adequate, and efficient preventive actions, emergency responses, and assistance during disasters. Preparedness efforts also aim to anticipate problems during disasters to establish effective methods to address these issues. Flooding is a seasonal threat occurring when water bodies overflow, inundating surrounding areas and causing physical, social, and economic damage. Floods are the most frequent natural threats that cause significant economic and humanitarian losses (Sakdiah & Zuhra, 2022). These results are in line with other studies that show the chi-square test produces a p-value of 0.037, smaller than the alpha value of 0.05 and a chi-square value of 6.595, so it can be concluded that there is a significant relationship between anxiety and adolescent preparedness in facing floods (Syofyan, 2022).

A significant relationship between anxiety and adolescent preparedness to face floods. Most respondents without anxiety showed readiness to face floods, while most respondents with anxiety were unprepared. However, the study also found 80 respondents without anxiety who were still unprepared. Interviews revealed this was due to a lack of knowledge about flood disaster management and the majority being young adolescents around 14 years old. The lack of preparedness was due to insufficient understanding and absence of education on the matter, thus no anxiety arose. Meanwhile, among 87 respondents with anxiety, 9 were still prepared due to knowledge gained from extracurricular activities such as scouting and youth

Red Cross, making them feel more ready in case of disaster. Anxiety and preparedness among adolescents are closely related. Adolescence is a period of many physical, emotional, and social changes. When faced with disasters such as floods, it is natural to experience anxiety. However, the level of anxiety is strongly influenced by how prepared they feel and how much they know what to do. Based on the findings, it can be concluded that there is a relationship between anxiety and adolescent preparedness in facing floods (Simbolon, Rohmah, Siregar, Sugiarto, Nurhusna, Praghlapati, & Nugroho, 2023).

CONCLUSION

Adolescence, as a dynamic transitional phase, is a crucial period for developing awareness, resilience, and preparedness in the face of disasters such as floods. Findings indicate a significant relationship between anxiety and preparedness, with adolescents experiencing anxiety being five times more likely to be unprepared than those without anxiety. Lack of knowledge and limited disaster education contribute to low preparedness, even among respondents who do not experience anxiety. Conversely, adolescents with adequate knowledge and extracurricular disaster-related experiences demonstrate greater preparedness despite experiencing anxiety. Overall, preparedness and anxiety are closely related, highlighting the importance of disaster education and adolescent engagement in preparedness programs to build a resilient and proactive generation.

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