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# The Relationship Between Knowledge and Social Support With Disaster Preparedness Behaviors in Surabaya

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**ABSTRACT**

**Introduction:** Active faults in Surabaya move at 0.05 millimeters per year, causing earthquakes. Disaster preparedness is crucial for safety, reducing risks, enhance capabilities, and mitigate the impact of disasters. This study analyzes the relationship between knowledge, social support, and earthquake preparedness in Surabaya using the Precede-Proceed model.

**Methods:** The method used in this study was correlational design with a cross-sectional approach. The total population of the study was 11,062 Ngagel residents, and a sample of 386 respondents from the Ngagel district was selected through purposive sampling. The independent variables in this study were knowledge and social support, while the dependent variable was the disaster preparedness behaviors of the local residents in facing earthquakes. The data were collected through a questionnaire and analyzed with logistic regression tests with a significance level of p≤0.05.

**Results:** The analysis results showed that there was a significant relationship between knowledge (p=0.000) and social support (p=0.000) with disaster preparedness behaviors.

**Conclusion:** Knowledge and social support have a positive relationship with disaster preparedness behavior, indicating a direct correlation. It is hoped that future researchers can conduct research with a wider range and add other factors that can initiate maladaptive responses.

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## 1. INTRODUCTION

Geographically, Surabaya is located on two faults that are thought to still be active and are thought to be capable of causing earthquakes with a magnitude of 6.5 on the Richter scale. (PUSGEN (Pusat Studi Gempa Nasional) Pusat Litbang Perumahan dan Permukiman, 2017). The latest research published in the Geophysical Research Letter reveals that the Kendeng Fault is actively moving with a movement of 0.05 millimeters per year and is the source of earthquakes in the East Java region. The Kendeng Fault stretches approximately 300 kilometers from Semarang, Central Java to East Java (Harnindra et al., 2017).

Research conducted by Rosalina (2018) said that areas that have a high vulnerability to the impact of earthquakes and have a high potential for building damage are in the sub-districts of Sambikerep, Lakarsantri, Wiyung, Dukuh Pakis, Wonokromo, Jambangan, Wonocolo and Gayungan. From Harnindra, Sunardi and Santosa (2017) The PGA value for the city of Surabaya in 1726:2912 ranges from 0.3g – 0.4g. The PGA value obtained by including the earthquake source from the Kendeng fault has a higher value. The survey location is on Jalan Flores, Ngagel Village, Wonokromo District. From this deterministic seismic hazard analysis, the dominant magnitude (M) and distance (R) which influence the punch location are also obtained,

namely the dominant magnitude (M) is 7 (Mw) and the dominant R is 12 Km (Harnindra et al., 2017). From (Setyoaji et al., 2019) people in the Surabaya area who do not yet understand earthquake disaster preparedness behavior.

During 2022, the Indonesian Disaster Data Geoportal recorded 3,321 disaster events throughout Indonesia. A total of 28 earthquakes were more than the previous year, namely 24 earthquakes in Indonesia (BNPB, 2022). Thursday 21 September 2018 an earthquake was felt in the city of Surabaya, the Surabaya City Government appealed to Surabaya residents to be prepared for possible disasters, disaster mitigation in the City of Surabaya is carried out with a proactive approach (Arif, 2020). Thursday 21 September 2018 an earthquake was felt in the city of Surabaya, the Surabaya City Government appealed to Surabaya residents to be prepared for possible disasters, disaster mitigation in the City of Surabaya is carried out with a proactive approach (Arif, 2020).

The Surabaya City Government held a disaster simulation and mitigation involving various agencies including Satpol PP, BPB Linmas, Transportation Service, BPBD East Java Province, Police, TNI, Tagana, Basarnas and residents of Krembangan District, Surabaya (Arif, 2020). Disaster mitigation education to the community is carried out routinely once a month. Apart from that, the Surabaya City Government also routinely provides education and mitigation to schools by establishing disaster preparedness schools, to sub-district level, to companies and malls. (Arif, 2020). This activity involves all residents from various age groups. So far the Surabaya City Government has established 6 Command Center 112 Disaster Response Posts, officers will come 7 minutes after receiving the report. (Arif, 2020).

Majority of Surabaya area is a built-up area, so efforts must be made to mitigate ground shaking against potential damage to buildings and the large number of fatalities due to the Kendeng Fault and Waru Fault. (Rosalina, 2018). In facing the threat of disaster, preparedness behavior is the key to safety (BNPB, 2017). The large number of victims due to disasters shows that community preparedness behavior can be said to be still lacking (Kristianto et al., 2018).

The theoretical approach used is the Precede-Proceed Model, explaining that behavior is influenced by three factors, namely predisposing factors, enabling factors and reinforcing factors. Social support provided by the community around this date is included in the driving factors that can influence a person's behavior, apart from that, the predisposing factor, namely knowledge, will influence a person's behavior, so it is hoped that this can explain the relationship between knowledge and social support and earthquake disaster preparedness behavior in the Ngagel Community. It is hoped that future researchers can conduct research with a wider range and add other factors that can initiate maladaptive responses.

## 2. METHODS

### Study Design

This research was a correlational study with a cross sectional approach.

### Population, Samples, and Sampling

The total population of the study was 11,062 Ngagel residents, and a sample of 386 respondents from the Ngagel district was selected through purposive sampling. Inclusion criteria of reaspondents were: Residents who have original KTPs from Ngagel Village, Wonokromo District, Surabaya, age 18-60 years, can read and operate mobile phone. While the exclusion criteria were citizens with disabilities.

### Instruments

The instrument used is a questionnaire which has been tested for validity using Person Product Moment (r) in SPSS 26 with a significance level of 5% and reliability using the Cronbach's Alfa formula and distributed to the Ngagel Community offline and online.

### Procedure

This research was carried out in April-May targeting people living in Ngagel Village, Wonokromo District, Surabaya City. This research has been ethically tested by the Health Ethics Committee of the Nursing Faculty, Universitas Airlangga. The ethics in this research were issued on March 31, 2023 with Ethics Certificate Number: 2815-KEPK. Data was collected by distributing questionnaires. After collecting data within the specified time limit, the researcher carried out data analysis and drew conclusions from the research that had been carried out.

### Data Analysis

The data were collected through a questionnaire and analyzed with logistic regression tests with a significance level of $p \leq 0.05$.

## 3. RESULTS

Based on the results of the demographic distribution in table 1, it shows that the majority of respondents were female, 209 (54.1%), with the largest age group being 26-35 years old, 106 respondents (27.5%) and >46 years old, 106 respondents. (27.5%). The education level of the respondents was mostly high school/equivalent education, namely 233 respondents (60.4%) with the majority of respondents' length of stay >16 years totaling 317 respondents (82.1%), some respondents had no disaster training experience, namely 238 respondents (61.7%).

Based on the distribution results in Table 2, it shows that the majority of respondents' knowledge was high, namely 232 (60.1%). Frequency

Distribution of Social Support Data for the Ngagel Village Community in Facing the Earthquake Disaster. From the table, it shows that the majority of respondents' social support was moderate, namely 205 (81.3%). Table 2 also shows that the preparedness behavior of most respondents was high, namely 233 (60.4%).

Table 3 shows the cross-tabulation results between knowledge and preparedness behavior for earthquake disasters. The tabulation results show that there are 173 respondents (74.6%) in the high knowledge category with high preparedness behavior. The results of the regression model formed, namely that the knowledge variable has a significance value of p=0.000 ≤ 0.05, which means the knowledge variable has a significant relationship with preparedness behavior with a regression coefficient of 1.357.

Table 4 shows the cross-tabulation results between social support and preparedness behavior for earthquake disasters. The tabulation results show that it can be concluded that respondents tend to have moderate social support with high preparedness with 141 respondents (68.7%). Apart from that, the parameters of social support are moderate informational support with high preparedness as many as 152 respondents (67.6%). The regression model formed on the social support variable, which has a significance value of p=0.000 ≤ 0.05, which means the social support variable has a significant relationship with preparedness behavior with a regression coefficient of 2.800.

Table 1. Distribution of demographic characteristics of respondents in the Ngagel Region, Wonokromo District, Surabaya City

| Characteristics of Respindents | | (f) | (%) |
|---|---|---|---|
| **Age** | | | |
| 1. | 17-25 years | 89 | 23.1 |
| 2. | 26-35 years | 106 | 27.5 |
| 3. | 36-45 years | 85 | 21.9 |
| 4. | > 46 years | 106 | 27.5 |
| Total | | 386 | 100 |
| **Gender** | | | |
| 1. | Female | 209 | 54.1 |
| 2. | Male | 177 | 45.9 |
| Total | | 386 | 100 |
| **Education** | | | |
| 1. | Elementary School | 8 | 2.1 |
| 2. | Junior High School | 27 | 7.0 |
| 3. | Senior High School | 233 | 60.4 |
| 4. | College | 117 | 30.3 |
| 5. | Not attending school | 1 | 0.3 |
| Total | | 386 | 100 |
| **Length od Stay** | | | |
| 1. | <16 years | 69 | 17,9 |
| 2. | > 16 years | 317 | 82,1 |
| Total | | 386 | 100 |
| **Disaster training experience** | | | |
| 1. | Yes | 148 | 38.3 |
| 2. | No | 238 | 61.7 |
| Total | | 386 | 100 |

Table 1. Description of knowledge, social support, and preparedness behavior of respondents

| Variables | | (f) | (%) |
|---|---|---|---|
| **Knowledge** | | | |
| 1. | Low | 24 | 6.2 |
| 2. | Moderate | 130 | 33.7 |
| **3.** | High | 232 | 60.1 |
| | Total | 386 | 100 |
| **Social support** | | | |
| 1. | Enough | 109 | 28.2 |
| 2. | Good | 205 | 53.1 |
| **3.** | Excellent | 72 | 18.7 |
| | Total | 386 | 100 |
| **Preparedness behavior** | | 79 | 20.5 |
| 1. | Low | 74 | 19.2 |
| 2. | Moderate | 233 | 60.4 |
| 3. | High | | |
| | Total | 386 | 100 |

Table 3. Cross Tabulation of the Relationship between Knowledge and Community Preparedness Behavior in Facing Earthquake Disasters

| Variable | Preparedness behavior | | | Total |
|---|---|---|---|---|
| | Low | Moderate | High | |
| | f (%) | f (%) | f (%) | f (%) |
| **Knowledge** | | | | |
| Low | 11 2,8% | 4 1% | 9 2,3% | 24 6,2 |
| Moderate | 48 12,4% | 31 8% | 51 13,2% | 130 33,7% |
| High | 20 5,1% | 39 10,1% | 173 44,8% | 232 60,1% |
| **Total** | 79 20,4% | 74 19,2% | 233 60,4% | 386 100% |
| **Logistic regression** p = 0.000 | | | **Regression coefficient (B)** 1.357 | |

Table 4. Cross Tabulation of the Relationship between Social Support and Community Preparedness Behavior in Facing Earthquake Disasters

| Variable | Preparedness behavior | | | Total |
|---|---|---|---|---|
| | Low | Moderate | High | |
| | f (%) | f (%) | f (%) | f (%) |
| **Social support** | | | | |
| Enough | 50 13% | 9 2.3% | 50 13% | 109 28.2% |
| Good | 24 6.2% | 40 10.4% | 141 36.5% | 205 53.1% |
| Excellent | 5 1.3% | 25 6.5% | 42 10.9% | 72 18.7% |
| **Total** | 79 20,4% | 74 19,2% | 233 60,4% | 386 100% |
| **Logistic regression** p = 0.000 | | | **Regression coefficient (B)** 1.357 | |

## 4. DISCUSSION

The Relationship between Knowledge and Community Preparedness Behavior in Facing Earthquake Disasters

The results of the research conducted show that there is a significant relationship between knowledge and community preparedness behavior in facing earthquake disasters with a positive regression coefficient which indicates that there is a unidirectional relationship, which means that the higher the knowledge, the community preparedness behavior will increase and vice versa, the lower the knowledge. then the community's preparedness behavior will decrease. These results are in line with research conducted by Rahmawati and Fatmawati (2022) that knowledge has a significant relationship with preparedness behavior, knowledge is the main factor and is the key to preparedness, the knowledge possessed is very helpful in disaster management.

This research is in line with Wu et al (2022) which says that knowledge has a significant effect on behavior, the stronger the disaster knowledge that residents have, the more adequate their disaster preparedness will be, residents without knowledge or less knowledge tend to stop doing something and stay put rather than immediately evacuating from their homes. This is also in line with research Oktari et al (2022) explains that good knowledge creation factors and knowledge creation factors owned by the community are important elements for increasing resilience in facing disasters.

The word "Knowledge" has a mixture of meanings that knowledge can be associated with various terms. Weichsel Gartner and Pigeon in Kusumastuti et al (2021) explains knowledge as a series of facts, data, information, knowledge, and wisdom. Knowledge management is defined as the process by which knowledge is created, shared and utilized. Knowledge management has been recognized as an important part of disaster management. Some of the roles of knowledge management in disasters are increasing humanitarian visibility, increasing the ability to make decisions, improving response capture, improving coordination, and assisting capacity development. (Kusumastuti et al., 2021). Meanwhile, preparedness behavior according to UU NO 24 Tahun 2007 is a series of activities carried out to anticipate disasters through organization and through appropriate and effective steps.

The results of this research's demographic data show that the highest educational history is high school, according to Suwaryo (2017) that the higher a person's level of education, the easier it is to receive information so that the more experience they will have, in this case especially knowledge about natural disaster preparedness behavior. Education is an increasingly important factor in everyday life, a person's level of education will influence a person's perception of cognition, the more highly educated they are, the more they have high levels of reasoning in receiving information. The results of the research data obtained show that tertiary education levels have low levels of preparedness due to other factors, namely the lack of exposure to information regarding the condition of the local area and the lack of public awareness of the environment.

The Relationship between Social Support and Community Preparedness Behavior in Facing Earthquake Disasters

The results of the research conducted explain that there is a significant relationship between social support and community preparedness behavior in facing earthquake disasters with the social support regression coefficient being positive, indicating that there is a unidirectional relationship, which means that the higher the social support, the community preparedness behavior will increase and vice versa, the lower it is. social support, the community's

preparedness behavior will decrease. These results are in line with the research conducted Setiawicaksana & Fitriani (2021) that there is a significant relationship between social support and disaster preparedness behavior because with social support individuals will involve emotions, instrumental assistance, providing information, and positive assessments in dealing with problems.

This research is also in line with Anggraini, Yaslina, Kartika, & Maidani (2018) that there is a meaningful relationship between social support and preparedness behavior because with the support provided by the environment around them individuals will support and strengthen the formation of behavior, and also the results of this research are in line with research that has been carried out by Yu, Sim and Qi (2022) that social support has a significant relationship with preparedness behavior. Social Support according to Sarafino and Smith in that social support refers to providing someone comfort, caring for them or appreciating them, apart from that by obtaining social support individuals will feel loved, cared for, appreciated, valuable and part of their social support.

According to Sarafino in (Kencana et al., 2021) Social support is divided into 4 aspects that must be fulfilled in order to create good social support, namely emotional support (expressions of empathy, care and attention), appreciation support (expressions of respect or positive appreciation), instrumental support, and informative support. Meanwhile, preparedness behavior according to the International Federation of Red Cross and Red Crescent Societies (IFRC) is an activity that makes plans in the face of disasters. The plans made must be effective, realistic and coordinated, and maximize the role of all aspects in society. Preparedness behaviors also include actions designed to increase the ability to undertake emergency actions to protect property from damage and disruption resulting from disasters, as well as the ability to engage in early post-disaster restoration and recovery activities. (LIPI-UNESCO/ISDR, 2006).

The results of the logistic regression test on each parameter of social support showed that the most dominant parameter was obtained by obtaining a large regression coefficient for instrumental support, while the parameter that was not in the same direction was emotional support which could be said to have no effect on the social support variable. The results of research in local areas have found that people are more prepared if they are given instrumental support from local volunteers, because with instrumental support such as community preparedness training so that they participate fully, however, emotional support alone, namely a sense of concern and attention, will not change community preparedness behavior. to be better.

## 5. CONCLUSION

Community knowledge in the Ngagel Region has a positive relationship with preparedness behavior, which indicates that there is a unidirectional relationship, meaning that the higher the knowledge, the greater the community's preparedness behavior. Community social support in the Ngagel Region has a positive relationship with preparedness behavior, which indicates that there is a unidirectional relationship, which means that the higher the social support, the greater the community's preparedness behavior. This research discusses the relationship between knowledge and social support and earthquake disaster preparedness behavior. It is hoped that future researchers can conduct research with a wider range and add other factors that can initiate maladaptive responses.

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