Did socioeconomic status influence psychological preparedness for potential disaster of resident around lapindo mud disaster

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Abstract. Lumpur Sidoarjo or known as LUSI is a geological disaster that has been going on for 14 years since 2006. It is considered as the world’s largest mud volcano eruption. It brings tremendous impact to the livelihood of the resident who live around the site. People live around the site mostly relied on the ponds as a living thus LUSI brings a devastated impact to the local communities. The condition has brought negative impact not only to their economic condition but also to their mental health. Study found that there are growing number of people live around the site that experience psychological problem. Psychological preparedness for disaster is one of the factors that could help people in coping with stress after disaster strike. Previous study has found that most of the resident live around the LUSI site has an average level of psychological preparedness. Research on psychological preparedness found that one of the factors that are associated with psychological preparedness is socioeconomic status. It is said that people with low socioeconomic status would also have a low level psychological preparedness. However, the relationship between socioeconomic status and the psychological preparedness in resident around lapindo mud disaster (LUSI) was unclear. Therefore, this study aimed to investigate the relationship between socioeconomic status and the psychological preparedness for potential disaster among resident around lapindo mud disaster. The study was conducted in Sidoarjo. Survey research was applied using a Psychological Preparedness for Potential Disaster scale as a mean to identify the psychological preparedness of the Sidoarjo people.

1. Introduction
Lumpur Sidoarjo or known as LUSI is a geological disaster that has been going on for 14 years since 2006. It is considered as the world’s largest mud volcano eruption. The mud volcano is still erupting up until now and greatly impact the life of communities around the site. People live around the site mostly relied on the ponds as a living thus LUSI bring a devastated impact to the local communities.

The condition has brought negative impact not only to their economic condition but also to their mental health. Study found that there are growing number of people live around the site that experience psychological problem [1]. LUSI in only 9 month period from the beginning of eruption has caused...
almost 14 billion rupiah [2]. The economic losses includes housing, road, buildings, public facilities, and industrial site destruction. In term of social impact, study has found that the victims and the survivor loose their possession, livelihood, land access and significant changes to their social ties [3]. It is also found that the survivor of LUSI experienced several psychological problems such as anxiety and depression [4], [5].

Research on the psychological impact of disasters has found that disasters could make the survivor develop acute stress disorder, Post-traumatic Stress Disorder (PTSD) and also other psychological disorders [6]. Negative impact of disaster is experienced by all of the population that affected by the disaster including children, adults, and elderly. Avoidance, angry, behavioural changes, physical complaints, regression and PTSD were found among children survivors [7]–[13]. Similar psychological response were also found in early and late adolescents, adult, and older adult [7], [10], [12], [14]–[17]. Substances abuse relapse also found to be be exacerbated as consequences of being exposed to a disaster [18], [19]. The devastated impact of being exposed to the disaster event could even last long after the disaster strike.

Research found that the impact of disaster could be seen and provide prolonged impact to the mental health of its survivor. Research found that on average natural disaster has negative impact on mental health of the affected [20], [21]. Study found that there are post-disaster mental health problems that has been identified including posttraumatic stress disorder, major depressive disorder and complicated grief disorder, substance abuse, and physical illness [22], [23].

Helping individual to successfully manage a disaster situation or disaster impact and to cope with psychological problem could help the survivor to reduce the psychological impact that they experiencing [24]. Researcher found that psychologically preparing individuals for a disaster could potentially decrease the psychological impact of disasters [21]. Individuals that are psychologically prepared could anticipate and identify their feelings, and to manage their emotional responses that can enable them to cope with the stress from being exposed to a disaster.

Study found that socioeconomic status is one of the factor that are contributed to disaster preparednes. People in high income status group were found to be more prepared compared to them from low income status group during and even after natural disasters [25]. Study on disaster preparedness among Tehran community in Iran conducted by Najafi et al (2015) also concluded that people with high income are more prepared than low income [26]. Although the role of socioeconomic in disaster preparedness has been documented in several studies, however the role of socioeconomic status is still unclear in related to psychological preparedness. In the present study, we evaluate the relationship between socioeconomic statuses on psychological preparedness amongst resident around lapindo mud disaster.

2. Methods
This was a quantitative research study that using survey method. This study involving 30 participants people that live in Kupang Village, Sidoarjo. Psychological Preparedness for Potential Disaster scale that are developed by the author were distributed to the participants.

Psychological Preparedness for Potential Disaster scale consist of three parts which are informed consent, identity, and the statement or question that participants need to response. The participant should put their agreement to be involve in this research in the informed consent part before they could move to the next part. Participants who are agreed to participate in this research that filled their identity which includes: age, gender, education background, job, and socioeconomic status in the identity part. The third part is the Psychological Preparedness for Potential Disaster scale 1.0. This scale consist of 71 items version which include 35 items of affective dimension, 13 items of behaviour dimension, and 23 items of cognitive dimension. The internal consistency of the scale is \( a = 0.796 \).

Fisher Irwin test was used to determine association between soioeconomic indicators measured by income and the psychological preparedness for potential disaster. All the analyses were carried out by using the Statistical Package for Social Science for Windows (SPSS, version 25.0, IBM, Armonk, New York, USA) and Social Science Statistics’ (http://www.socscistatistics.com/tests/chisquare2/Default2.aspx) [27].
3. Results

3.1 Demographic profile
The participants involve in this study were 30. All of the participants were live in Sidoarjo and most of them are working as a seaweed ponds farmer. In term of gender, most of the respondents participated in this study were male (53%) and female (47%). The age group lies between 19 years old until 50 years old. The socio economic status of the subject in this study were mostly in middle income category (60%) with income per month were in the range IDR 1.000.000 up to 10.000.000 and low income category (40%) with income per month less then IDR 1.000.000. As for educational level, the majority of the participants were in junior high school (63%), senior high school (33%) and undergraduate (4%). In term of employment status, most of the participant were working full time (57%), not working (30%), and working part time (13%). The summary of the demographic profile of the participants in this study could be found in the table below (Table 1).

Table 1. Demographic profile

| Characteristic                      | f  | %  |
|------------------------------------|----|----|
| Age group (years)                  |    |    |
| Teenage (12-25 yo)                 | 7  | 23 |
| Early Adult (26-35 yo)             | 13 | 43 |
| Adult (36-45 yo)                   | 6  | 20 |
| Elderly (> 46 yo)                  | 4  | 14 |
| Gender                             |    |    |
| Female                             | 14 | 47 |
| Male                               | 16 | 53 |
| Socioeconomic status               |    |    |
| Low income (< IDR 1.000.000)       | 12 | 40 |
| Middle income (IDR 1.000.000-10.000.000) | 18 | 60 |
| High Income (>IDR 10.000.000)      | 0  | 0  |
| Educational level                  |    |    |
| Elementary                         | 0  | 0  |
| Junior high                        | 19 | 63 |
| Senior high                        | 10 | 33 |
| Undergraduate                      | 1  | 4  |
| Postgraduate                       | 0  | 0  |
| Employment Status                  |    |    |
| Full time                          | 17 | 57 |
| Part time                          | 4  | 13 |
| Not Working                        | 9  | 30 |
3.2 Psychological preparedness level

The data collection shows that psychological preparedness for potential disaster variables were range between 45 to 59. This is shows that the lowest value is 45 and the highest value is 59. The average value of psychological preparedness for potential disaster is 51.79 (Table 2).

| Psychological preparedness for potential disaster |   |
|--------------------------------------------------|--|
| Total                                            | 30 |
| Range                                            | 45-59 |
| Mean ± SD                                        | 51.79 ± 4.31 |

Table 3. Psychological preparedness for potential disaster level based on norms

| Psychological preparedness for potential disaster level | f  | %  |
|--------------------------------------------------------|--|--|
| High                                                   | 5 | 17 |
| Average                                                | 20| 66 |
| Low                                                    | 5 | 17 |

The classification of the psychological preparedness fo potential disaster were based on the values obtain in each participants data and it is categorized in three group namely high, average, and low. Data were classified as high if the value is greater than mean + SD, average if the value is between mean – SD and mean + SD, and low if the value is less than mean + SD.

The majority of the participants were in average level of psychological preparedness for potential disaster (66%). While high and low level of psychological preparedness for potential disaster were both have the equal number which is 17% from the total participants.

3.3 Psychological preparedness level based on socioeconomic status

Level of psychological preparedness was found different between socioeconomic statuses. The participants of this study were come from middle and low income socioeconomic status. Most of the participant were working as a seaweed pond farmer that relies in the pond that are affected by the mud flow disaster.

The majority of the respondent in middle income group were in average level of psychological preparedness (50%). While the participants in the middle income group that have high and low level of psychological preparedness were only 7% and 3% respectively.

Participants in the lower income group were equally spread in low (13%), average (17%), and high (10%) of psychological preparedness. The summary of level of psychological preparedness based on socioeconomic status could be found in table 4.
3.4 Socioeconomic status and psychological preparedness level

The main focus of this research was an attempt to predict disaster behaviour based on a socioeconomic status. The data obtained on this study was relatively small and its not normal and linear. Therefore, Fisher Irwin test was used to determines the association between socioeconomic indicators measured by income and the psychological preparedness for potential disaster. All the analyses were carried out by using the Statistical Package for Social Science for Windows version 26.

Table 5. The p-value of the relationship between socioeconomic status and psychological preparedness for potential disaster

| Psychological preparedness for potential disaster | Low income | Middle income | High income | p   |
|--------------------------------------------------|------------|---------------|-------------|-----|
| Low                                              | 4          | 1             | 0           | 0.48|
| Average                                         | 5          | 15            | 0           |     |
| High                                             | 3          | 2             | 0           |     |

In the table 5 above shows that the number of the data were 30 and there is no missing data. The fisher test showed that there was no significant association between gender and psychological preparedness for potential disaster among resident around lapindo mud disaster with $X^2 (1, N = 30) = 6.04$, $p < 0.01$.

4. Discussions

The data analysis shows that socioeconomic status and psychological preparedness for potential disaster is not significantly related. This finding is in line with previous study that conducted by Gladwin & Peacock (1997) in their study on the household preparation of the south florida community response prior to hurricane andrews disaster [28]. In this study they found that the disaster preparedness and socioeconomic status is not significantly correlated. In this case, it was found that the time between beginning preparation and the onset of the hurricanes did not vary significantly by income. It is conclude that people did not prepared themselves in advance prior to the disaster. This is also become the case among resident around lapindo mud disaster, vast majority of the participant were less psychologically prepared for potential disaster. We can see that from the result that the majority of the resident around lapindo mud disaster were in average level. This is due to their economic condition that were mostly in low and middle income category that made them unable to invest more in preparing themselves for disaster.
In terms of socioeconomic status, we found that most of the people in the middle income group have average levels of psychological preparedness for disaster. While the low income group were mostly in the low position of psychological preparedness for disaster. The study of impact of flood and drought in rural Sri Lanka has come to the same conclusion that the people from low income families have low capacity to protect themselves and their assets, as well as they could not afford to live in areas that less exposed to risk of disaster [29]. It was found that this is due to their financial limitation which affect their capacity to increase their preparedness for disaster due to their top priority was still in fulfilling their basic need [30].

People in low socioeconomic status has a lowest level of psychological preparedness since their economic condition made them unable to provide even the basic disaster preparedness tool. Several disaster preparedness research has found that the disaster preparedness reciprocally determined through the amount of available resources [31]–[33]. Limited resources also restricted them to get access to disaster risk reduction effort (e.g., evacuation routes information, disaster preparedness related training, post disaster aid). Thus, beside economic vulnerability, lack of access to disaster related aid and information has also influence individual disaster preparedness capacity. As a result individual in low socioeconomic status will also have low level of psychological preparedness for potential disaster.

5. Conclusion
In conclusion, we could found that psychological preparedness for potential disaster among the resident around lapindo mud disaster was not affected by socioeconomic status due to the present of other variables beside socioeconomic status that could also influence the psychological preparedness for potential disasters. The other variables that could influence psychological preparedness for potential disaster are the person top priority, the amount of resources, economic vulnerability and lack of access to disaster related aid and information.
However, there is still a lot of work to do to identify the main concern of the resident around mud disaster which made them invest less in psychological preparedness for potential disaster effort. This could be done by using a qualitative method to explore the participant psychological preparedness for potential disaster using interview

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