NURSE ROLE ON BUILDING
COMMUNITY RESILIENCE IN MERAPI: PREPAREDNESS PHASE

Melyza Perdana\(^1\), Nurul Hidayah\(^2\), Ratna Puji Priyanti\(^3\)*
\(^1\)Gadjah Mada University, School of Nursing
\(^2\)Muhammadiyah University of Magelang, School of Nursing
\(^3\)Stikes Pemkab Jombang, School of Nursing
*Correspondence: ns.ratnapuji@gmail.com

ABSTRACT
Introduction: Mount Merapi in Yogyakarta is one of Indonesia’s phenomenal volcanoes. This mount erupts predictably every 3-5 years. One of the most eminent eruption happen in 2010. Community resilience development would prevent huge loss and damage from the event. Method: This paper critically examines the available literature that explores problems and nurses roles in building resiliency of Merapi’s community. Examining the problems that occur in Merapi eruption, and finding the literature to answer the problems and encourage the nurse to building community resilience. Results: There were several problems identified. The risk perception, by letting the community knows about the information to recognize the damage cause by disaster. Then, the cultural and religion approach is the key action in building community trust. By understanding the culture, the nurse can emerge with the community and empowering them. The last part is the social, economic and politics. The nurse role and function in building the community resilience by educating and empowering the community to recognize the risk, diagnose the problem, and implementing the preparedness. Conclusion: Yet, more studies need to conduct to find more evidence related to disaster preparedness and community resilience and using the cultural and religion approach.Key words: community resilience, nurse role, volcano eruption

INTRODUCTION
Indonesia is a supermarket for disasters, such as earthquakes, tsunamis, and volcano eruptions (WHO, 2010). Particularly Yogyakarta, located in Java. It was reported that within these two decades, Yogyakarta had 2 big disasters which were Bantul earth quake in 2006 and the latest one Merapi volcano eruption in 2010. Interestingly, Merapi volcano eruption is the most frequent one due to its own regular eruption cycle. Merapi volcano has a history of deadly eruptions in the last century, occurring every 3–5 years. Merapi has displayed both explosive and effusive activity throughout its eruptive history; however, activity over the last 225 years has been dominated by the viscous extrusion of basaltic-andesite lava domes and subsequent small gravitational, or explosive, dome collapse (Camus et al., 2000). Merapi volcano is one of the most active volcanoes worldwide, with more than 70 eruptions since 1548 (Voight et al., 2000). Since the fourteenth century, 61 eruptions of Merapi have killed over 7000 people (Lavigne et al., 2000). Notable among these was the eruption in 1672, which killed 3000 people, and the highly explosive eruption in 1872, which killed 200 people. More recently, the eruptive events in 1930–1931 and 1954 killed 1400 and 54 victims respectively (Thouret et al., 2000). In 1961, a 12-km long pyroclastic flow destroyed more than eight villages along the Batang River, killing six persons and in November 1994, a pyroclastic flow reached 7 km distance down the Boyong River (Wilson et al., 2007). Due to the unpredictable nature of the 1994 dome’s collapse, the lack of short-term precursors (Voight et al., 2000) and the presence of a hill which triggered a decoupling of the dilute ash-surge from the basal valley-
confined flow, 69 people were killed by pyroclastic flows and 6000 people were evacuated during and after the 1994 event (Abdurachman et al., 2000). And in 2006, an avulsion of a pyroclastic flow killed two people near the Gendol river channel at Kaliadem village. More than 22,000 people were evacuated in 2006 (UNOCHA, 2006) and the Kaliadem touristic area located on the upper Gendol river was buried by a pyroclastic deposit (Charbonnier and Gertisser, 2008). 324 people died and 598 people are hospitalized due to severe burns, respiratory problems, and broken bones. Moreover, The National Disaster Management Agency (BNPB) had at its disposal IDR 397 billion to help disaster victims.

Considering that every disaster often pose temporary and long-term threats to public health and government, some strategies are needed to develop by involving the community surrounding. Since under resourced communities are at high risk for adverse outcomes owing to pre-existing disparities in health, access to services, and environmental risks. Large-scale events disrupt physical, social, and communication infrastructures posing challenges to response, and creating “surge burdens” that overwhelms care resources and strain social supports. Events such as Merapi eruption have increased government awareness of the impacts of disasters and of gaps in communication, infrastructure, and resources that limit capacities to respond and recover. Today, there are 1.1 million people living on Merapi slopes and these communities need more attention in the terms of preparedness in Merapi eruption strike (Camus et al., 2000). Learning from the big impact of Merapi eruption in 2010, The National Disaster Management Agency of Indonesia (2013) recommend some strategies especially in disaster risk reduction by developing a better governance in DRR, strengthen the law/ policy, strengthen partnership with the key basic elements of the disaster management by change the paradigm of effective DRR through building community resilience and empower the community.

Community resilience (CR) is one paradigm that has emerged both national and international. The Community and Regional Resilience Institute defines community resilience as not only prepared to help preventer minimize the loss or damage to life, property and the environment, but also it has the ability to quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and swift economic recovery (Chandra et al, 2013). Based on a community systems model, CR refers to community capabilities that buffer it from or support effective responses to disasters. Such capabilities include effective risk communications, organizational partnerships and networks, and community engagement to improve, prepare for, and respond to disasters. These capabilities may improve outcomes such as access to response and recovery resources, or return to functioning and well-being.

BUILDING RESILIENCE IN MERAPI COMMUNITY
Special Issue In Merapi Eruption

Community resilience is a multidisciplinary approach and it involves a complex interaction of individuals, families, groups and the environment (Zang, 2011). To deal with community resilience attention must be given to the contextual condition of society, notably to issues vulnerability (Tobin, 2012). Therefore, when nurses are going to develop some strategies in strengthen the community resilience; nurses have to examine some specific aspect within the community. Lavigne et al (2008) revealed some interesting issue within Merapi community;

Risk perception

In Merapi study it was found that the information among the residents about actual process of volcanic eruption and the information of hazard and risk that caused by volcano eruption were poor. Even though, there is no valid information about how poor of information about the eruptions process in this
community. The information about the volcanic eruptions process and hazard caused by eruption may they get from different sources (Lavigne, 2008). The internal sources were from the past experience in the eruption. As we know the merapi had been erupted for more than 10 times in the past century. For those citizens that have the past experience may have many information about the volcanic eruptions process. The other source is the external sources that may address by the teacher, journalist and local authority. And all of these information is not spread equally within the community.

Besides the poor information about risk perception of volcanic eruption, safety feeling is also essential. People in Merapi have their own belief of their safety. They have the traditional early warning system called “kentongan” to warn them if the volcanic eruption may harm them that control by the key person (java:jurukunci) not the government. In addition, they also feel safer due to the contour of Merapi to their village. People who lived in the flanks of Merapi feel more protected from pyroclastic flows by Sabo Dams, whereas such concrete structure tends actually to raise the riverbed and therefore to increase the pyroclastic surge hazard (Lavigne, 2008). Therefore commonly people live near the Sabo Dams will be protected from the hazard. However, people do not realize that currently the Merapi eruption pattern is changing (Subandrio, 2010). Therefore, a new evacuation route is emerged.

Evacuation way is one of priority in eruption. People in Merapi beside have strong belief in merapi contour that will protect them, they also has their own evacuation way. The government built this evacuation route. However, there are some issues that the evacuation sign was written in Bahasa. Most of people in Merapi has low education since the population mostly over >50 years. They communicate using traditional way, using traditional language, Java which is totally different from Bahasa. So this language barrier may prolong the evacuation process.

Cultural & Belief

Specific efficacy belief is the most powerful determinants of behavior, risk reduction behavior can be encouraged by integrating hazard education within the community development progress (Paton, 2001). Local people in Merapi area are very strong attached to their home village (Tobin, 2012), so that one main point to assess the community development is through its cultural and belief. All Indonesian volcano has its own legends, so does Merapi. As other Indonesian volcano, Merapis’ legend also involved Gods, Prince, Princess and mortals. The type of society that very strong in culture and belief could affect the risk perception. It is not only about culture and belief, the whole legends is about religion, its Hindu and Budha the first religion that come to Indonesia may affect the legends. Therefore, involving cultural leader in building Merapi community resilience is very important.

Social economic and politic

Two most important factors in socio economic and politic that need to be assessed are: 1. Traditional social factor; 2. Difficulties in assessing the live hood before and after the disaster. Merapi residents mostly are aged over >50 years old. One of the cultural in Merapi society is respect the older opinion as a counselor the decision making. The decision to evacuate or comeback to a hazardous area after having moved is usually taken as a community decision, where the chief of village (kepala desa) as the representative of the government plays the important role than the one played by authorities (Lavigne, 2012). However, the jurukunci (cultural leader) plays much more important role, especially for the elderly. Jurukunci appointed by the traditional king/kingdom in Yogyakarta, as the result of the strong cultural, beliefs and religion factors. The jurukunci beliefs that he could talk to the spirit of the mountain, so he could predict the eruption or know the damages that will cause from the eruption, he also may suggest many
kind of ceremony to calm down the angry of the mountains’ spirits.

Another thing is occupational issues. Most of the people in Merapi depends their life in farming. They have many cattle and farm field. In order to keep their property, most of them bring their cattle (cows, chicken, and sheep) to the shelter during the evacuation. This condition is even worsen the shelter condition. The market conditions also we have to consider the most. How people in merapi sloes and flanks live it depends on the farming, when lava flow their farming, then they could not have the harvest to make the money. They will be back immediately to their home if their think the situation is better, because they have to earn money for living. Therefore, nurses play very important role in this situation. How nurses can help them fulfilling their basic need by corporating with NGO and government to also prepare a temporary market for them is nice to think.

Figure 1 is a rough schematic outlining how these components may fit together. In the figure, the underlying health (physical & psychological) and economic well-being of the community affect the ability of the community to respond and recover quickly. It is critical to have data about the vulnerable population within the community. For instance, nurses have to know how many of the residents undergoing TB medication, how many of them should have regular hemodialysis, etc. Therefore, when disaster strikes, nurses have already prepared some strategies to maintain residents’ medication. Besides, sustaining an overall level of physical health, or psychological wellness is also important, by providing individuals with coping resources. Pfefferbaum et al. (2008) propose that population wellness, in measuring overall mental health and quality of life, serves as an appropriate indicator of community resilience and adaptation.

The second key component in preparing community resilience is social-economic factor. The root of social and economic equity is socioeconomic status (SES). The core components of SES are education, income, occupation, and wealth. In general, disaster response activities can include leaving an area ahead of a disaster and returning once the disaster has subsided. However, low-income populations may not own cars or have access to extra cash for temporary housing (Morrow, 1999). Moreover, a low SES, cultural and linguistic barrier can shape communication and meaning, perceptions of risk, and the capacity to understand public health messages making these people less likely or able to respond appropriately to a significant health incident. Therefore, in this situation, public health and emergency managers can do several things.

Core Component of Community Resilience in Public Health Setting

![Image of Core Component of Community Resilience in Public Health Setting]

Figure 1: developed a model for building community resilience Chandra et al (2013)
including creating evacuation plans that do not rely on individual resources and providing premade home disaster kits for low-income populations (Wells et al, 2013).

Next, the engagement of all types of local stakeholders (government, local organization, and cultural leader) in preparedness planning as well as efforts for communicating risk effectively is essential, particularly for sub-groups at greater risk. Effective risk communication is essential to resilience because on the most basic level, it protects physical health by providing accurate information about dangers and behavioral options for mitigation. It increases knowledge and therefore strengthens a community’s adaptive capacity. In addition, effective risk communication builds trust and overcomes distrust, which can have important consequences for mental health, likely adherence to government recommendations, and social cohesion. Effective risk communication means selecting messages, messengers, and strategies for delivery that succeed in disseminating risk information across the stages of a disaster. The risk communication process begins before an event occurs. Communications must be offered in multiple modes (using pictorial media and trusted messengers in addition to written materials) as well as in multiple languages. If we implement the effective risk communication in Merapi area, then we have to consider the elderly population, which is the highest proportion in the Merapi. In giving some education or even evacuation route, nurses have to choose the right approach to elderly. For example, by giving the educational program in local language (java language), providing traditional alarming system (using bamboo’s sound), or even by providing the evacuation route in java language will be more effective.

Finally, social connectedness is important for health security because social networks can be used for information and resource exchange before, during, and after an event (Plough et al, 2013; Wells et al, 2013). Social connectedness refers to the personal (e.g., family, friend, neighbour) and professional (e.g., service provider, community leader) relationships among community residents. When residents have relationships with other members of their community it increases their attachment to the community, access to real and perceived social support, social capital (i.e., feelings of trust and norms of reciprocity that develop as a result of relationship; and promotes a sense of community i.e., “a feeling that members have of belonging) (Pietrzak, 2012). Research has shown that individuals who live in communities with these characteristics have better psychological, physical, and behavioral health (Varda et al., 2009).

All in all, these five components contribute to the development of community resilience, which is further enhanced by continued learning that emerges from on-going disaster experience.

Nurses’ Role in Building Merapi Community Resilience

In building Merapi community resilience nurses can adapt Chandra et al (2013) model to play the roles.

- **Surveillance for current health status of community**
  Prior significant public health incidents highlighted how the underlying physical health of the population (e.g., the number of residents with chronic conditions) can greatly affect the community’s ability to respond and recover. By knowing the vulnerable population (elderly, pregnant women, children, chronic disease patients) will help the nurses build a resilience in preparedness phase.

- **Health education for all communities member (psychosocial needs, hygiene, etc)**
  Adequate health education in preparedness phase do make different. At least it will give the communities a prior knowledge related to disaster. In Merapi communities, besides focus in
psychosocial issues, hygiene in shelter is also important due to the over-crowded shelter and sometimes people tend to bring their chattel to the shelter.

✓ Build health system planning for disaster preparedness (clinic, shelters, etc).

Even though many shelters have been built, only few of the shelter are completed by clinics. Involving nurses in building the shelters may become a good idea. Nurses also can increase the community resilience in merapi eruption, for instance by providing some tools kit for eruption for each family that contain face mask, coat, etc that will protect them from the volcano ash in merapi eruption (Chandra et al, 2013).

✓ Together with government and local organization campaign community preparedness communication resilience (Wells et al., 2013; Plough et al., 2013; APEDNN & WHO, 2012) and holding a drill esp. evacuation. Tobin (2002) proposed the most important thing to prepared in volcano eruption in how we prepare the evacuation route.

CONCLUSION AND FUTURE CHALLENGES

Nurses are not only being resilient individuals, but also have to prepare their clients’ resilience within ecosystems (Fritsch & Zang, 2009). Optimizing nursing role in disaster resilience is a new challenge because only few of the literature in resilience are from nursing point of view. Lately many nursing organization try to raise nurses’ role in resilience (APEDNN & WHO, 2012), by implementing the evidence in the field can support nurse roles and functions in disaster field. Performing a drill is one of important key point. The corporation between government, local organization, and cultural leader is considered as basic component in order to strengthen the cohesiveness as well as resilience within the community.

A few research has been done by Indonesian regarding disaster especially resilience in Indonesia. Conducting more research is a challenge for Indonesian nurses to dig up more evidence related to disaster. Another challenge for Indonesian nursing scholar is the cultural and religion diversity. Cultural diversity has also not been well-addressed with respect to constructs of resources and community (Hobfoll et al., 2007; Norris et al., 2008). Some cultural backgrounds may react differently towards disaster. As we can see in the Merapi community, disaster planning should involve cultural leaders and additional research on this topic should seek to identify “non-traditional resources” that foster resilience in diverse cultural groups.

REFERENCES


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