

Natural disasters and COVID-19: health worker preparedness and response

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Abstract. The purpose of this study was to determine the preparedness of health workers individually and in the workplace to deal with natural disasters during COVID-19. Data collection was carried out by distributing online questionnaires through social media with a total number of respondents, namely 68 health workers. The research questionnaire was adapted from the COVID-19 Preparedness Checklist for Rural Primary Health Care and Community Settings. During the COVID-19 pandemic, health workers' personal readiness to deal with natural disasters is still lacking. Primary health care and hospitals do not yet have adequate health facilities to deal with COVID-19, and in the case of a natural disaster, the situation will worsen.

1 Introduction

As the number of natural disasters rises, so does the demand for qualified health workers. Competence in the context of disaster management activities should be acquired by education and training so that health personnel is better prepared to deal with potential disasters [1]. COVID-19 and other natural disasters are causing a lot of damage in Indonesia right now, thus steps are needed to lessen the impact in the future, such as strengthening disaster management and raising preparedness [2].

Several studies have been undertaken to determine how well health personnel are equipped to deal with natural catastrophes and COVID-19. As a way to improve disaster preparedness, disaster simulations have been conducted for health students [3]. Nurses in Hong Kong are still frequently underprepared and incompetent [4]. The same thing happened in Indonesia, where disaster preparedness and understanding of roles are still lacking. Continuous education is needed to strengthen the capacity of health workers in disaster preparedness, response, recovery, and evaluation [5].

A country requires the readiness of human resources, standard operating procedures, and health facility infrastructure to deal with the COVID-19 cases [2]. Although mitigation and readiness initiatives to combat the disease have been adopted in several countries, the procedures in place to deal with COVID-19 cases are still inadequate. Affected countries have requested assistance in dealing with COVID-19 in their respective jurisdictions

[6]. This study assesses the preparedness of health workers personally and at work to deal with natural disasters during the COVID-19 pandemic.

2 Methods

The preparation of health workers to deal with natural catastrophes during the COVID-19 pandemic is investigated using a descriptive cross-sectional research approach. Data was gathered via social media-distributed online questionnaires. The questionnaire is in the form of a link that respondents can fill out. Respondents in this study were health care professionals who worked in primary health care and hospitals and were willing to take part in the research. A questionnaire adapted from the COVID-19 Preparedness Checklist for Rural Primary Health Care and Community Settings was used to collect data [7].

3 Results

This study included a total of 68 respondents from various primary health care settings and hospitals, as shown in Table 1.

Table 1 shows that 51.5% of respondents are under 30 years old, 82.4% are women, 55.9% have a bachelor's degree last education, and 69.1% work in primary health care. Health workers in this study have different educational backgrounds

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Table 1. Demographic characteristics of study participants (N=68)

Characteristics	n	%
Age (years)		
- < 30	35	51.5
- > 30	33	48.5
Gender		
- Male	12	17.6
- Female	56	82.4
Educational level		
- Diploma	30	44.1
- Bachelor	38	55.9
Profession		
- Doctor	5	7.4
- Nurse	22	32.4
- Public Health	13	19.1
- Others	28	41.1
Agency		
- Primary Health Care	47	69.1
- Hospital	21	30.9

Table 2. Health Workers' Preparedness

Survey items	Yes		No	
	n	%	n	%
Are you aware of the disaster risks that may occur in the area where you live and work?	63	92.6	5	7.4
Have you prepared a survival kit (a bag containing items needed in case of a disaster) at home?	21	30.9	47	69.1
Have you prepared a survival kit (a bag containing items needed in case of a disaster) at work?	41	60.3	27	39.7
Have you planned a gathering point for family members in the event of a disaster?	29	42.6	39	57.4
Have you kept your valuable documents in a safe place?	57	83.8	11	16.2
Do you already have copies of essential documents that you can bring along with your survival kit in case of a disaster?	34	50	34	50
Have you ever attended disaster training?	22	32.4	46	67.6
Have you ever assisted disaster victims?	28	41.2	40	58.8
If the agency you work for holds disaster preparedness training, would you be interested in participating?	67	98.5	1	1.5

Table 2 demonstrates that 92.6% of respondents already know the risk of disasters that may occur in their

region of residence and work. More than half of the respondents (69.1%) had not prepared a disaster survival kit at home in the event of a disaster, but 60.3% had prepared a survival kit at work. As many as 57.4% of respondents have not arranged a spot to congregate with their families in the event of a disaster. Respondents who have kept valuables in safety storage are 83.8%. A total of 67.6% of respondents have never participated in disaster training, 58.8% have never assisted disaster victims, and 98.5% are willing to participate in disaster training. As many as 62% of respondents will contact their families in the event of a disaster, and most of the respondents, 92.6%, stated that disaster information could be obtained through the internet (social media, official website).

Table 3. Health Facilities Preparedness in Facing COVID-19

Survey Item	n	%
Type of health facilities		
- Primary Health Care	47	69.1
- Hospital	21	30.9
Availability of disaster management guidelines		
- Yes	48	70.6
- No	20	29.4
Availability of patient handwashing facilities		
- Yes	68	100
- No	0	0
Separate waiting room for patients with COVID-19 symptoms		
- Yes	51	75
- No	17	25
Separate examination room for patients with COVID-19 symptoms		
- Yes	51	75
- No	17	25
The practice of physical distancing		
- Yes	48	70.6
- No	20	29.4
Availability of adequate PPE		
- Yes	56	82.4
- No	12	17.6
Ownership of guidelines for handling COVID-19		
- Yes	64	94.1
- No	4	5.9
Routine disinfection		
- Yes	60	88.2
- No	8	11.8

Table 3 summarizes that 69.1% of respondents work in health centers, 70.6% of respondents stated that in health facilities there are disaster management guidelines available, all health facilities have provided handwashing facilities for patients, as many as 75% of respondents stated that waiting rooms and examination rooms are between patients with COVID-19 symptoms and other patients have been separated, 70.6% of respondents stated that patients can implement physical distancing in health facilities, 82.4% stated that the available PPE was adequate, 94.1 already had guidelines for handling

COVID-19, and 88.2% had carried out routine disinfection.

Table 4 shows that 72.1% of respondents have attended seminars related to COVID-19, 67.6% have attended PPE training, 94.1% stated that they already have PPE guidelines in the workplace, 89.7% said that masks and handsoons have been facilitated adequately, 83.8% can implement physical distancing in their workplace, and 94.1% have carried out routine COVID-19 symptom checks.

Tabel 4. Health Worker Safety

Survey Item	n	%
Experience attending seminars related to COVID-19		
- Yes	49	72.1
- No	19	27.9
Experience in PPE training		
- Yes	46	67.6
- No	22	32.4
Availability of PPE guideline		
- Yes	64	94.1
- No	4	5.9
Availability of adequate masks and handsoons		
- Yes	61	89.7
- No	7	10.3
The practice of physical distancing in the health facility		
- Yes	57	83.8
- No	11	16.2
Routine COVID-19 symptom detection		
- Yes	64	94.1
- No	4	5.9

4 Discussion

Disasters are complex problems that require emergency health services immediately and in the long term can trigger the emergence of public health and psychological problems for victims [8]. Health services are the essential sector during pre-disaster, emergency response, and post-disaster because humans are the most important element to be saved in the event of a disaster [9]. In areas especially prone to disasters, it is necessary to prepare professional health personnel and supporting medical equipment to increase the capacity to deal with disasters, both in hospitals and community health centers [10]. Hospitals and primary health care are health service providers who have an important role in the event of a disaster. The earthquake in Nepal in 2015 damaged health care centers, which were needed at the time, making basic health services difficult to access [11].

The results of this study indicate that most health workers already know the risk of disasters that may occur in their area. Less than half of the respondents have prepared survival kits at home, but most have prepared them at work. Most of the respondents have not determined the point of gathering with their families, more than half have stored valuables in a safe place. Less than half have attended disaster training and assisted

disaster victims. It can be concluded that the personal preparedness of health workers in this study is still low.

Health workers and other support staff in a health facility are not fully prepared to deal with disasters. Until now, the most effective method for preparing health workers for disasters is not known and evaluation is still needed regarding their willingness to assist in the event of a disaster [12].

Khalaileh et al., (2012) stated that only 42% of nurses were aware of the disaster management plan in their workplace. Most of the respondents are not aware of the level of preparedness of the health system in their workplace to deal with disasters. There is no Jordanian national action to prepare nurses for disasters. Workshops have been held and several universities have included disaster preparedness in the curriculum but no evaluation has been carried out on the extent of nurses' understanding of disaster management [13]. The same results were found in the research of Rassin et al., (2007), the level of disaster preparedness is still low, while early preparation significantly affects the health care system to respond to disasters [14].

The capacity of the primary health care system in rural Vietnam is inadequate to respond to health problems caused by storms and floods [15]. In central Vietnam as many as nine out of ten primary health facilities have a plan for dealing with floods, and four facilities receive regular flood preparedness training. Six facilities reported a lack of support for disaster response [16].

Currently, Indonesia is faced with an increase in COVID-19 cases and ranks fourth with the most positive confirmed cases in Asia [17]. Data from the Indonesian Medical Association shows that until March 2, 2021, the number of health workers who died from COVID-19 was 718 people [18]. The ratio of the number of doctors to the total population of Indonesia is 0.38 per 1000 population. Availability of hospital beds in Indonesia 1.2 per 1000 population in 2015 [19]. Based on this condition, it can be concluded that Indonesia does not yet have adequate health facilities to deal with COVID-19 and it will be even more difficult if another natural disaster occurs.

Not all health facilities provide separate rooms for patients with COVID-19 symptoms. There are still health facilities that find it hard to implement physical distancing, both patients and health workers. This is possible because of the limited area of health facilities. Until now, there are still health facilities that do not have adequate PPE and not all officers have attended PPE training. This condition is a factor causing the high number of positive confirmed cases among health workers.

5 Conclusions

This study explored the preparedness of health workers personally and at work to deal with natural disasters during the COVID-19 pandemic. The study shows Indonesia does not yet have adequate health facilities and health workers to deal with COVID-19 and it will be even more difficult if another natural disaster occurs.

References

1. A. Y. Loke, O. W. M. Fung, Nurses competencies in disaster nursing: Implications for curriculum development and public health. *Int J Environ Res Public Health*, **11**, 3289-303 (2014).
2. M. I. Firmansyah, F. Rahmanto, D. Setyawan, The preparedness for the COVID-19 pandemic management in Indonesia, *JAKI*, **8**(2), 188-201 (2020).
3. B. G. Kaplan, A. Connor, E.P. Ferranti, L. Holmes, L. Spencer, Use of an emergency preparedness disaster simulation with undergraduate nursing students, *Public Health Nurs*, **29**(1), 44-51 (2012).
4. O. W. M. Fung, A. Y. Loke, C. K. Y Lai, Disaster preparedness among Hong Kong nurses, *J Adv Nurs*, **62**(6), 698-703 (2008).
5. Martono, Satino, Nursalam, F. Efendi, A. Bushy, Indonesian nurses perception of disaster management preparedness, *Chinese Journal of Traumatology*, **22**, 41-6 (2019).
6. A. A. Thobaity, F. Alshammari, Nurses on the frontline against the COVID-19 pandemic: An integrative review, **3**, 87-92 (Dubai Med J. 2020).
7. COVID-19 PHC Action Group, COVID-19 preparedness checklist for rural primary health care and community settings (2020).
8. D. E. Hogan, J. L. Burstein, General concepts: basic perspectives on disasters. In Hogan, D.E., Burstein, J.L. (Eds.), *Disaster Medicine*. second ed. Philadelphia: Wolters Kluwer & Lippincott Williams & Wilkins (2010).
9. United Nations. Health and Disaster Risk Reduction <http://www.wcdrr.org/uploads/HEALTH.pdf> (2014)
10. A. Boyd, N. Chambers, S. French, D. Shaw, R. King, A. Whitehead, Emergency planning and management in health care: priority research topics, *Health Systems*, **3**, 83-92 (2014)
11. M. L. Hall, A. C. K. Lee, C. Cartwright, S. Marahatta, J. Karki, P. Simkhada, The 2015 Nepal earthquake disaster: lessons learned one year on, *Public Health*, **145**, 39-44 (2017).
12. J. R. Gowing, K. N. Walker, S. L. Elmer, E. A. Cummings, Disasters preparedness among health professionals and support staff: what is effective? An integrative literature review, *Prehospital and Disaster Medicine*, **32**(3), 1-8 (2017).
13. M. A. A. Khalaileh, E. Bond, J. A. Alasad, Jordanian nurses' perceptions of their preparedness for disaster management. *International Emergency Nursing*, **20**, 14-23 (2012).
14. M. Rassin, M. Avraham, A. Nasi -Bashari, S. Idelman, Y. Peretz, S. Morag, et al, Emergency department staff preparedness for mass casualty events involving children, *Disaster Management and Response*, **5**(1), 36-44 (2007).
15. H. V. Minh, T.T. Anh, J. Rocklov, K. B. Giang, L. Q. Trang, K. G. Sahlen, et al, Primary healthcare system capacities for responding to storm and flood-related health problems: a case study from a rural district in central Vietnam, *Global Health Action*, **7** (2014).
16. A. Alga, T. A. T. Dang, D. D. Saulnier, G. T. Nguyen, Jv. Schreeb, Hope for the best. prepare for the worst-an assessment of flood preparedness at primary health care facilities in Central Vietnam *Int J Environ Res Public Health*, **15**, 1-8 (2018).
17. Worldometers. Reported Cases and Deaths by Country or Territory [Available from: <https://www.worldometers.info/coronavirus/> (2021) [Accessed June 18, 2021].
18. D. Prajogo, A. Sudiarno, Sohal A, Maryani A, Rahman A, Dewi DS, et al. Discrepancies in facilities and services among hospitals in Indonesia increase COVID-19 risks among health workers [Available from: <https://theconversation.com/discrepancies-in-facilities-and-services-among-hospitals-in-indonesia-increase-covid-19-risks-among-health-workers-157336> (2021) [Accessed June 18, 2021].
19. Deloitte. Rising to the COVID-19 health care challenge in Indonesia [Available from: <https://www2.deloitte.com/id/en/pages/life-sciences-and-healthcare/articles/rising-to-covid-19-health-care-challenge-in-indonesia.html> (2020) [Accessed June 18, 2021].