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Challenges for Healthcare Workers Caring for COVID-19 Patients in Indonesia: A Qualitative Study

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Abstract

COVID-19 pandemic raises various challenges faced by health workers in hospitals. This study explored strategies for overcoming challenges in caring for COVID-19 patients at hospitals in Indonesia based on healthcare workers' experience. In-depth interviews were employed with 28 healthcare workers (physicians and nurses) who were purposively sampled. Data were collected via phone and analysed using the Colaizzi method. Five following challenges were found: difficulties in working with personal protective equipment (PPE), offline training for handling Covid and using PPE not being implemented evenly for all health workers, physical and psychological fatigue, difficulties in carrying out health education and assessment towards patients and families, and limited resources to cope with the COVID-19 pandemic. Meanwhile, some barriers require support from the government, public and hospital managers. The information gained from research on the strategies for caring for COVID-19 patients can contribute to better preparedness for hospitals and health workers facing the COVID-19 pandemic.

Keywords

COVID-19, personal protective equipment, health worker, health services, good health

Highlight

What do we already know about this topic?
Challenges for frontline healthcare workers handling COVID-19, including shortages of Personal Protective Equipment (PPE), physical and psychological exhaustion, healthcare staff shortages and high workloads.

How does your research contribute to the field?
Pandemic preparadness for health workers includes the using of standards PPE, increasing knowledge and skills, recruiting an adequate number of health workers and managing the working hours in order to provide optimal service to patients.

What are your research's implications towards theory, practice, or policy?
Health care workers take part to educate the community in reducing stigma and hoaxes, prioritized PCR testing for patients with severe symptoms and optimizing the hospital network for patients who need of care.

Introduction

SARS-CoV-2 is a new type of ribonucleic acid (RNA) single stranded virus first discovered in Wuhan, China, in December 2019 cause of COVID-19.[1] COVID-19 is highly contagious.[1,2] The sign and symptoms range from mild upper respiratory tract infections, usually fever (82%) and cough (81%), to severe acute respiratory distress syndrome (ARDS) and sepsis. The mortality of COVID-19 will increase in older adults or patients with several comorbidities such as Chronic

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Obstructive Pulmonary Disease (COPD), Tuberculosis, Diabetic Mellitus, hypertension, Chronic Kidney Disease (CKD) and heart failure.[2–5]

Based on data from the World Health Organization (WHO), as of October 14, 2021, there were 239 million cumulative confirmed cases globally. Indonesia has a high cumulative number of confirmed COVID-19 cases until October 14, 2021, reaching 4.2 million cases.[6] As of October 7, 2021, in Indonesia, the total number of confirmed cases of Covid-19 reached 4 225 871.[7] Twenty-one provinces have reported the Delta variant and the proportion of positive test results is >20% in 33 of 34 provinces.[8] This condition directly increases the burden on healthcare facilities and hospitals in handling patients with COVID-19 in Indonesia.

During the pandemic, healthcare workers (HCWs) have become afraid and anxious that the virus will infect them and affect their families, especially when they witness their co-workers getting infected.[9] Also, asymptomatic patients and the fact that there is still no cure for COVID-19 increase these concerns.[10] HCWs have severe occupational health risks because they are in frequent and direct contact with COVID-19 patients. It is estimated that 3000 HCWs have been infected with COVID-19 in China, and 22 have died.[11,12] In Indonesia, at least 40 HCWs have died, which has affected the psychological health of other HCWs.[13]

The other problems are: the difficulty in triaging emergency patients suspected to have COVID-19, which has the potential of increasing the spread of the disease among emergency patients; limited isolation wards and personal protective equipment (PPE); difficulty in determining the level of care required; and insufficient critical care settings to meet the increasing demand.[14] In addition, in this challenging situation, HCWs are required to demonstrate high performance in the absence of definitive COVID-19 treatment and an increasing number of cases.

Lack of knowledge of the novel pathogen and pandemic preparedness for control and management of infections among HCWs often lead to delayed diagnosis, disease transmission among HCWs and poor infection control practices.[12,15] Based on the COVID-19 outbreak in Italy, some of the concerns about the increased risk of transmission to health workers include clinical management (oxygen therapy, oxygen administration and non-invasive ventilation; management of airway clearance for patients requiring tracheal intubation), availability of PPE, physical burden and the psychological health of workers.[16] Healthcare workers' anxiety was further influenced by the emergence of stigmatization and a loss of trust from their own communities.[17]

In this study, various medical and psychological problems present barriers to healthcare workers in dealing with COVID-19 patients in Indonesia. This is also found in studies conducted in the UK, China and the US that reported challenges for frontline healthcare workers handling Covid-19, including shortages of PPE, physical and psychological exhaustion, healthcare staff shortages, high workloads and long shifts, delays in COVID-19 testing, and challenges in enforcing social distancing and health protocol.[15,18,19] These issues cannot be fully captured through a standard questionnaire approach but require a tool that allows HCWs to describe their work process and experiences in the field. Using qualitative methods makes it possible to understand the experiences of HCWs and discover undisclosed information.[20] Qualitative methods with a phenomenological approach can also help answer questions about the clinical experiences in services and explore the perspectives and empathetic responses of HCWs in carrying out their duties.[21]

Purpose

Healthcare workers caring for COVID-19 patients have a high risk of being infected due to frequent exposure to infected patients. They are also required to provide the best service to the patient in a pandemic situation. However, the COVID-19 pandemic raises various challenges faced by health workers in hospitals. This study explored strategies for overcoming challenges in caring for COVID-19 patients at hospitals in Indonesia based on healthcare workers' experience.

Methods

Design

This study used a qualitative descriptive design (QD)[22,23] to explore the experiences of health workers (nurses and physicians) when treating COVID-19 patients in hospitals located in Indonesia. This design is considered appropriate because it allows researchers to explore phenomena in their original forms.[22] Health workers were recruited and interviewed while they were caring for COVID-19 patients with the aim of exploring the challenges they experienced and the strategies they used to overcome them. The use of the QD design allows the data collected to truly reflect the insights, perspectives and experiences of participants[22] to produce comprehensive findings on the challenges facing health workers during the COVID-19 pandemic. In addition, this design is commonly used in the field of nursing and health study[22,23].

Participants

This study used a snowball purposive sampling method. Participants recruited in this study were physicians and nurses caring for COVID-19 patients from August to September 2020 at COVID-19 Referral Hospitals in Surabaya, Indonesia. The inclusion criteria for this study were: (1) Nurses and physicians who had/are treating patients with confirmed or suspected cases of COVID-19; (2) ability to communicate using Bahasa Indonesia and (3) willing to be interviewed 2 times during the study period. The recruitment phase ended when data saturation was achieved and no new information was gained. 30 health workers were contacted for interviews;

2 people were not willing to be respondents because they did not want to be recorded.

Data Collection

Before making initial contact with potential participants, the chief physician and nurse of the COVID-19 wards at the 2 hospitals were contacted to recommend candidates. Furthermore, after each interview, each participant recommended co-workers who could be recruited for the study. Participants who are willing to participate in the study were sent consent documents via email and then asked to fill in their demographic data and schedule a date for the interview through Google Forms. The 3 interviewers have conducted the interview process. The 2 interviewers were lecturers who hold Master's degrees in nursing and have 4 years' experience in qualitative studies, and 1 interviewer was a pulmonary specialist who had experience treating patients with pneumonia and SARS infections. All interviews were conducted in the Indonesian language (Bahasa) by telephone, zoom call, WhatsApp video and other video call tools. The interviews were recorded as either audio-only or audio-video for 30–45 minutes. The participants were interviewed twice. The first interview was focused on data collection, and the second was to validate the transcripts and results. Observations during data collection and field notes on the interview process were recorded via both audio and video where available. A total of 8 interviews had no audio-visual recordings. Field notes and audio-visual recordings were used to facilitate recall and for further exploration of non-verbal language. After the entire interview process is complete, compensation is given to participants in the form of money.

Semistructured interviews were developed to enable participants to share their experiences at the workplace in caring for COVID-19 patients. Interview questions and the questionnaire on participant demographics was compiled after conducting a literature review of the treatment of patients with COVID-19 and other respiratory infections[9,24–27]. The empirical questions about the treatment of COVID-19 were added through discussions with physicians and nurses who specialize in respiratory infections. The participants were asked: 'Please tell me about your experiences when you cared for patients with COVID-19 (experiences using personal protective equipment, interactions with patients and families, diagnostic tests, intervention and therapy). What challenges did you encounter when providing care for them, and how did you overcome them'?

Data Analysis

Analyses of descriptive data from the sociodemographic questionnaire for frequencies and means were performed using SPSS 24. Audio recorded interviews were analysed and interpreted using the Colaizzi method. This method allows the data to be clarified by the participants, leading to possible changes in results.[28]

In the first step of Colaizzi, the interview results were transcribed verbatim in a written form, and then the transcript was read 3 times to gain a comprehensive understanding of the participants' thought processes and feelings. Step 2, researchers analysed each transcript to identify specific statements from the transcript. These statements were written separately for each participant and coded as the transcript page number and line number. Step 3, the researchers formulated a general meaning for each significant statement from the text. Meanings are formulated from significant statements and discussed with peer group members. Then, the code and general meaning were given to the peer expert to check the correctness of the process and consistency. Step 4 conveyed the interpretive meaning to events and situations and arranged them into themes and subthemes. Step 5, each theme was integrated into a complete description of the challenging phenomenon in treating COVID-19 patients. Then, presented and discussed to the experts to ensure it reflects their phenomenon. In the last step, the results and findings were validated with the participants by sending email 'the findings and transcript' then followed up by phone after they read. All participants expressed satisfaction and agreement with the data and conclusion.

Rigour and Trustworthiness

Several strategies were used to ensure the trustworthiness of data collection and analysis. The research team ensured a rigorous qualitative data collection and analysis process.[29] The first three interviews were used as pilot interviews. These pilot interviews were evaluated with a senior qualitative researcher to assess credibility, verify understanding of the questions and ensure responses were consistent with the research objectives. After the pilot interview, the interview questions proved to be valid and there were no changes; the interviews with the 3 participants were all still included in this study. To maintain research credibility, interview transcripts were given to participants to ensure that the findings matched their experiences and there were no objections. Also, each member of the research team had checked the transcripts and the findings through a thorough discussion process. Two senior physicians and nurses were also invited to discuss and review the themes and findings formulated by the research team.[30,31] One of the reviewers has a long experience treating patients with pulmonology disease.

The researchers also created a reflective diary to express thoughts, ideas and feelings about the challenges in caring for COVID-19 patients. The researchers used this reflective diary to minimize 'researcher bias' and identify anything potentially influencing the research process and findings. Reflective diaries contain such as: 'What do I 'know' from the participant'?, 'How do I 'know' that'?, 'What assumptions do I make about these participants'? and 'How will my beliefs affect the questions I ask'?. It allows the researcher to reassess (if necessary) behaviour, attitudes, question-wording or other aspects of data collection.[31,32]

Table 1. Characteristics of Participants (n = 28).

Characteristic	n (%)
Gender	
Male	13 (46.4)
Female	15 (53.6)
Education	
Diploma degree	1 (3.6)
Bachelor's degree	17 (60.7)
Master's degree	4 (14.3)
Specialist physician education	6 (21.4)
Profession	
Pulmonologist	3 (10.8)
Anaesthesiologist	1 (3.6)
Internist	2 (7.2)
Resident	5 (17.9)
General physician (GP)	1 (3.6)
Nurse	16 (57.1)
Marital status	
Married	22 (78.6)
Unmarried	6 (21.4)
Work setting	
Intensive care unit for COVID	8 (28.6)
High care unit for COVID	9 (32.1)
Emergency unit for COVID	5 (17.9)
Inpatient ward	2 (7.1)
Outpatient department	4 (14.3)
Training about COVID-19 management	
Yes	11 (39.3)
No	17 (60.7)

Translation

The translation process is an important part of analysing qualitative research data.[33] Data needed to be translated from Indonesian into English so that non-Indonesian speakers could understand it. In this study, translation was carried out using the following method: topics relevant to the research were identified; translated the verbatim, field notes and relevant topics into the English language; a reverse translation of the same was made into Indonesian (Bahasa); and the differences between the 2 versions were examined and discussed. The researchers collaborated with 2 bilingual people to carry out the translation process. The first translator translated literally word for word, including field notes, and the second translator translated back into Bahasa.[34] If there were discrepancies, discussions were held until a final version agreement between the researchers was achieved.

Ethical Considerations

Ethical approval and study permissions were obtained. Informed consent was signed by each participant before being interviewed and was coded to maintain anonymity. Data was stored in a locked cabinet and all electronic copies were password protected and could only be accessed by the team.

Findings

Description of Sample

A total of 28 participants were obtained: 12 were physicians and 16 nurses (Table 1) aged between 29–45 years with an average age of 35.0 ± 4.0 years. Of the 28 respondents, two nurses had tested positive for COVID-19 while on duty caring for COVID-19 patients. Most of the nurses and physicians (60.7%) worked in the ICU and HCU rooms; the 2 hospitals where the study was conducted were COVID referral hospitals, so most of the patients admitted had moderate and severe symptoms. COVID-19 patients with mild symptoms were treated in the usual inpatient room. Guidelines for determining patient and room criteria were in accordance with the guidelines issued by the Ministry of Health of the Republic of Indonesia (Decree of Minister of Health Republic of Indonesia, 2020[35]).

The study participants had been in charge of handling COVID-19 patients for at least 1 month and a maximum of 6 months, with an average length of 4.6 ± 2.5 months of working with COVID-19 patients. Table 1 outlines the characteristics of the participants.

Themes

Five themes were found, which are summarized below. Samples of quotes for each theme are shown in Table 2.

Theme 1: Difficulties of working with personal protective equipment (PPE). All participants experienced difficulties when working using PPE level 3. There were 6 reported difficulties experienced when wearing PPE while working. Various difficulties that were stated by the participants included being too hot (14 participants); feeling excessively sweaty; thirsty and dehydrated (4 participants); communication difficulties, not being heard/hearing properly when speaking or listening (8 participants); and difficulty during physical examination (7 participants), it being especially hard to hear breathing sounds during lung auscultations. Participants chose alternative examinations such as X-rays or CT scans to support the diagnosis. Five physicians had difficulty performing a physical examination in the initial examination of the covid diagnosis, and 2 nurses had difficulty carrying out a physical examination to evaluate the results of the interventions given.

Participants also reported difficulties in invasive implementation such as injections, intravenous line insertion, taking blood specimens for laboratory tests, lung punctures, and helping fulfil the patient's Activity Daily Living (ADL) needs. As many as 20 participants reported that this difficulty was due to the foggy, blurry face shields and insensitivity to touch due to wearing coated gloves. Several strategies have

Table 2. Summary of Challenges and Possible Strategies in Management of COVID-19 Patients.

No	Challenges	Quotation	Strategies to solve	Quotation
1	Difficulties in working with personal protective equipment (PPE)			
	A. Heat	'… wearing PPE is really hot, especially during the fasting month'. (P4) '… I felt hot when I wore PPE, especially at the beginning of the pandemic, when I used PPE level 3 for the first time'. (P3)	Using air conditioning	'It does not feel so hot inside, maybe because we are using AC (Air conditioner)'. (P1)
	B. Dehydration	'… I wear it for half an hour only, and I sweat a lot. When we leave the COVID room, the clothes are wet like after a bath. I Feel dehydrated when I come out'. (P20) 'Usually I feel dehydrated, and I noticed my friends are the same as me: dehydrated too'. (P10)	Consume more fluid	'After removing the hazmat, I drink a lot of water – almost 1 Litre water in one go'. (P10)
	C. Unable to communicate well	'Face shields and masks make it difficult to hear clearly. Sometimes my voice is not heard by patients and their families'. (P14) 'It's a little difficult for us to communicate because I have to wear PPE, multi-layered masks, use N95, and a surgical mask. The patient also wears a mask, so sometimes they don't hear what I say'. (P4)	Shouting and using non-verbal communication	'When I anamnesis COVID-19 patients, I sometimes have to shout and raise my voice to make it clear'. (P14) 'I also mime the injection if I want to explain the intervention that I will make'. (P4)
	D. Problems when conducting a physical examination	'We find it difficult to do a physical examination, such as auscultation with a stethoscope – it can't be as comfortable as it was without PPE…' (P14) '….to use a stethoscope is indeed difficult, as I cannot hear the sound of breathing. Is there a problem or not? Difficult to determine…' (P16) '…after suctioning the mucus for the patient with ventilators. I can not evaluate the result of the intervention. It's difficult to check their breathing with PPE' (P1)	Modify physical examination procedures and add other supporting examinations	'I just do a physical examination once, and I also rely on other tests, such as X-rays'. (P14) 'Well, I do the auscultation, but from behind, from the back of the patient. I think this is safe'. (P16)
	E. Difficulty in performing treatment: therapy and compliance with the patient's ADL	'Next is the limitation of carrying out therapy such as nebulization, Cardiopulmonary Resuscitation (CPR) and also intubation, it's too risky for the medical personnel, so we cannot do it'. (P14) 'We use the double shield, goggles and a face shield, so sometimes it's blurry and dewy. So if we look for the veins it's not too clear, even though we have to put our IV line – it is difficult'. (P1) '…most of the time I feel blurry when wearing goggles and face shields. It limits me when I have to do thoracocentesis. Also, it difficult to determine the point of thoracocentesis because I have to wear double gloves'. (P16)	Modifying therapy procedures	'I also try to minimize contact with COVID patients. If there are drugs entered by infusion or injection, we try to combine the administration only once ... It is a challenge for us because sometimes patients may need correction and repeated therapy. Well, that's a challenge for us'. (P14)
			Modifying goggles/face shield	'We use chlorhexidine soap to coat the face shield, so it doesn't get dewy. It makes it look clear again'. (P10) 'So sometimes we use polydine on the goggles to help clear our view'. (P1)
			Requesting assistance from colleague	'I will ask a friend who is on the same shift. So at least we can look for veins together, so that will make me relax. But if I really can't take the blood specimen, it will be drawn on the next shift ...' (P12)
			Using assisting tools	'… and also sometimes I assisted by a vein viewer'. (p10) 'At the hospital we have a vein viewer, if there is a problem (taking blood/IV-line placement) I use the vein viewer'. (P15)
	I. Unable to fulfil the basic needs of the health worker	'Of course, I must hold it if I want to take a pee, but if I want to defecate when I am still wearing PPE, ... I am permitted by another member to leave ...' (P6) 'I may be unable to drink or fulfil other needs. So yes, for 4-5 hours, I have held'. (P1)	Take a turn with another colleagues	'It's okay if I cannot finish the therapy. My friend will help at the next shift'. (P6)
			Eat and drink first	'I always suggest to my friends before entering (the isolation room), we have to eat and drink enough first, or I recommended to sholat (pray) first'. (P15)
	J. Limited time to implement the therapy	'The difference is in the time of care. I can't be flexible. Before the pandemic, I could go back, in and out of the room. But now I can't …' (P6)	Make a complete preparation before implementation	'... I must be properly managed (before implementing the therapy). If I enter (the isolation room), I have to prepare everything …' (P6)

(continued)

Table 2. (continued)

No	Challenges	Quotation	Strategies to solve	Quotation
2	Offline training on handling COVID-19 or using PPE not being implemented evenly for all health workers	'The problem at the beginning of the pandemic was that there was no training. Only videos that were shared by the hospital about how to use PPE, how to remove PPE. Some my colleagues followed the offline training, but I didn't get it'. (P1) '... Because of the pandemic we had in-house training via Zoom, so it was not face-to-face training'. (P15)	Looking for information individually	'At the beginning of the pandemic, there was no training, so I just read and read the guidelines from the CDC or the Ministry of Health of Indonesia, etc.' (P26) 'I ask my friends who work at another hospital to share information about how to use PPE'. (P7)
			The hospital provides guidelines and online training	'We get a guidebook issued by the hospital, brochures and also interactive videos about universal precautions, both downing and how to use PPE and also how to wash our hands according to the WHO guidelines. It is shared through Whatsapp groups'. (P14)
3	Physical and psychological exhaustion	'I feel exhausted, when I come home I always fall asleep immediately. The patients never decrease, but increase more and more every day'. (P2) 'Now, I feel more tired in a psychological way than physically. I Feel down and ask when this pandemic will be over'. (P4)	Shift arrangements and arrange off-work time longer than usual	'So, nurses get 7 days off each month. Then yes we try not to get too tired. We work a maximum of 5 days per week'. (P19)
			Screening for physical conditions	'We (health workers) are checked for vital signs twice a day in the morning and evening. Then, we ask when we are contacted with the suspicion of COVID-19. If there is a problem with our physical condition, we consult directly to the internist'. (P19)
			Screening for psychological conditions	'Every week an assessment is carried out to monitor psychological conditions using the Hamilton Anxiety Rating Scale (HARS). If there is a high score, they will be advised to go to psychiatry'. (P19) 'The hospital has a consultation session either via telephone or WhatsApp to psychiatry for health workers who are experiencing psychological fatigue. If needed, there is direct contact with psychiatry'. (P26)
4	Difficulty in performing health education and *anamnesis* in patients and family			
	A. Resistance regarding COVID-19	'From the beginning of the pandemic, until now, there is a stigma from the community. They thought that the diagnosis of COVID-19 was just a hoax. So, that is the difficulty when educating patients'. (P14) 'Many patients and families are deniers, especially when they are first diagnosed with COVID-19. They must be worried that due to various media reports or perhaps the lack of knowledge about COVID. It will be an educational challenge for us'. (P7)	Education	'Yes, I keep performing health education. I repeat performing health education until they understand'. (P2)
			Give back all the decisions to the family	'I leave the decision to the patient's family. I have previously provided information about the prognosis of the COVID-19 and its management'. (P7)
	C. Dishonesty of information from patients and their families	'It is more about how the patient or family conveys the correct information. Based on my experience, some colleagues get infected because of misinformation about their contact history with people suspected to have COVID-19. It is the most challenging obstacle for me'. (P4)	Explore the information further	'Even though the patient doesn't want to admit it. I keep asking questions until finally he admits'. (P4)
			Explain about the consequences of dishonesty	'I try to explain again, such as informing about the worst impacts if COVID-19 patients aren't treated properly. I highlight that it will be transmitted to the family'. (P8)

(continued)

Table 2. (continued)

No	Challenges	Quotation	Strategies to solve	Quotation
5	Limited resources			
	A. Understaffing	'When in the buffer room, due to limited nurses, there are 2 nurses on each shift with 20 patients. It's a bit overwhelming too'. (P20)	Recruit volunteers	'There are volunteers from the Ministry of Health and the provincial government'. (P10)
			Prioritize the main intervention	'At the beginning of the pandemic, due to the limitation of nurses, we will prioritize the main intervention. After that, we will do other things for example, oral hygiene'. (P6)
	C. The amount of PPE is insufficient and does not meet the standard criteria	'Our PPE is not enough. At the beginning of the pandemic, it was not complete. Recently, thank God, it has started running well since there is domestic PPE production. In the beginning, the PPE was donated, so we don't' know whether the PPE meets or not the standard criteria of the ICP (infection prevention and control) committee'. (P21)	Reporting to hospital management	'If I found there was a problem with the PPE, I reported it to the pharmacist or ICP committee'. (P15)
			Buying PPE for personal use	'Finally, I bought our own goggles and face shields, which were good quality. So, I don't just rely on PPE from the hospital'. (P21)
	E. Limited PCR swab tools	'At the beginning of the pandemic, PCR swabs were limited. But now there are a lot of PCR swabs for COVID-19'. (P8)	Prioritize patients for PCR swabs	'I have to choose who is a priority for getting PCR swabs, according to the condition and score of the patient'. (P8)
	F. The length of the diagnostic procedure	'Patients have to wait for laboratory results for up to several days in the emergency room because the process is rather long for diagnostics'. (P24)	Explain to patients and family	'Yes, stay calm and inform the patient if you have to wait for laboratory results'. (P24)
	G. The available staff have limited skills	'It is a little difficult when I have to collaborate with health workers who initially were not from the ICU. Their skills were a bit lacking for the ICU'. (P6)	Online basic training	'I received basic training, starting from the K3 (Occupational Safety and Health), PPI (Infection Prevention and Control) committee and others, including online nursing care for COVID-19 patients'. (P15)
		'Many volunteers from a fresh graduate who still lacked experience'. (P15)	Changing the team composition in a shift	'That's why in one shift, we always have senior nurses so they can guide volunteers. If not, wow, it will be a mess because many fresh graduates still lack experience, especially amid such conditions'. (P15)
	I. Limited wards for COVID-19	'In the last month, around May–June, there were no restrictions on the number of patients who entered the hospital. So, the halls of the ER were full with patients – it reached 20 patients in one shift. It made it so that the room did not meet the standards for isolation'. (P20)	Adding and modifying the room	'There are additional rooms with HEPA filters. They have been converted into COVID-19 rooms, and a new building has also built for COVID-19 patients'. (P20)
			Refer to other hospital	'If the COVID-19 room is full, I refer the patient directly to another hospital. We have eleven hospital in Surabaya that are able to receive COVID-19 patients'. (P23)

been implemented to overcome this problem, including combining injection drugs in one administration if possible, washing goggles with chlorhexidine soap, asking colleagues for help, and using tools such as vein viewers or installing an arterial line to help take arterial Blood Gass Analysis samples (BGAs) continuously. A total of 5 participants said that they had limited time and were not flexible during treatments. The solution used to overcome this is to prepare carefully for every treatment so that no action is missed or left behind when intervening with patients. A total of 11 participants in charge said they could not freely drink, urinate, and defecate when using PPE level 3. They had to wait after completing all the treatments or do these activities before using level 3 PPE.

Theme 2: Offline training on handling Covid or using PPE not being implemented evenly for all health workers. Only 11 participants were given offline training before treating COVID-19 patients. The training provided was mainly about the use of PPE and the removal process of PPE. One of the efforts made by HCWs is to seek material regarding handling COVID-19 and universal precautions. The hospital is also trying to make e-books and videos about PPE then distribute them to their staff in charge.

Theme 3: Physical and psychological exhaustion. Some participants (n = 15) reported that they were experiencing physical and psychological fatigue. Physical fatigue is felt when wearing PPE, while psychological fatigue was related to the uncertain future of the pandemic ending and people's ignorance about health protocols. Some of the efforts made by the hospital and the health team are to arrange shift schedules that allow adequate rest time for HCWs. There are efforts to help the nurses get a minimum of 7 days off in a row. In addition, the hospital conducts periodic screenings for physical and psychological examinations for health workers.

Theme 4: Difficulties in carrying out health education and assessments for patients and families. A total of 11 participants stated that they were facing difficulties when performing health education and assessments for families and COVID-19 patients. Participants reported a stigma from the community regarding the forced diagnosis of COVID-19, causing families or patients challenging the information provided by HCWs. During the assessment, patients and their families were dishonest about their contact history with COVID-19 sufferers or travel history in the red zone. The participants give information and ask continuously to seek information from families and patients (n = 7). The other 4 participants handed back all decisions to the family around treatment.

Theme 5: Limited resources. Resource barriers were reported by 18 participants, ranging from limitations in staff numbers, limited PPE resources, limited PCR swab equipment, length of diagnostic procedures, limited skills of available HCWs, and limited wards for COVID-19 patients. The efforts that have been made to overcome the limited staff numbers were to recruit volunteers, arrange and alternate break times more efficiently, and improve teamwork.

The strategy implemented by the participants to overcome the incompatibility of PPE with the standards was to report it to the hospital management so that they could check the quality of the PPE. In addition, participants also volunteered to buy PPE themselves to make them safer and more comfortable while caring for patients with COVID-19.

The PCR swab tool's limitations appeared at the beginning of the pandemic; 5 participants reported this. Besides that, the process of establishing a COVID-19 diagnosis also took a long time. Participants tried to explain to families if there would be a time constraint in establishing a diagnosis of COVID-19. In addition, the limitations of the PCR swab tools meant that participants had to be able to sort out the suspected COVID-19 patients who were to be examined first.

The volunteer recruitment also raised another obstacle, namely, the limited skills of fresh graduate volunteers. The participants reported overcoming the problem by adjusting the composition of each team. Every team on duty always strove to involve expert HCWs to guide volunteers with limited skills. The hospital also provided basic training about infection controls and prevention for volunteers before handling COVID-19 patients.

Ward limitations also occurred during May–June 2020 because the number of patients increased, and the rooms used for COVID-19 isolation are still small. The hospital is trying to add more wards for COVID-19 patients. Also, participants will try to find COVID-19 wards at another hospital if there are too many patients.

Discussion

This study highlights the challenges and strategies when caring for COVID-19 patient from the perspective of HCWs. Almost all participants (HCWs) stated that the PPE used when working to treat COVID-19 patients is uncomfortable. This study is in line with other research stating that the complicated and lengthy procedure for using PPE and its extended usage causes increased workload and fatigue. HCWs also found it uncomfortable to use masks and other PPE equipment for long periods.[36] The standard protective equipment used when treating COVID-19 inpatients are the Respirator N95 or FFP2 or FFP3 standard or equivalent, gown, gloves, eye protection, and apron, complemented by maintaining hand hygiene (WHO[37]). Personal protective equipment used by HCWs is necessary for preventing transmission.

Difficulties in communication is another challenge arising from the mask and face shield worn. Participants need to shout when communicating with patients, family, and co-workers. Participants also found it difficult to do physical examinations. Goggles that are used are often dewy and block vision. The interventions include IV-line installation, blood sampling, and fulfilling patients' ADL requirements. The difficulties reported by the participants were in accordance with a study which stated that the use of PPE hampers the

majority of surgical performance in COVID-19 patients. The obstacles that are felt are visual disturbances, communication problems, and decision making. Discomfort at work and fatigue quickly increases.[14] The other study results stated that the use of level 1 PPE for a range of several hours every day to several hours each week resulted in a high level of difficulty, discomfort, decreased hearing acuity, sight and doffing.[9]

Offline training about how to wear PPE is difficult to hold and was rare at the beginning of the pandemic because it was not mandatory. This result is in line with the research results that indicated a lack of staff training on COVID-19 and the use of PPE.[36] Participants received online training regarding the use of PPE as a substitute solution for offline training. Another study shows that high flexibility in online learning and training is a solution for pandemic situations. Online simulations and video recordings of clinical skills are very helpful for the current situation, but its weakness is that it does not provide direct feedback.[38] The lack of PPE and the provision of inadequate quality equipment are serious concerns for HCWs. The availability and quality of PPE must also be maintained as the COVID-19 outbreak continues.

This study revealed that physical and psychological fatigue was prevalent due to the large number of patients that had to be treated and the continuous use of level 3 PPE. This result is supported by a study that states that the COVID-19 pandemic demands a high volume of work for HCWs due to the large number of patients.[13] These high job demands increase the risk of psychosomatic symptoms.[39] Poor psychological health among health care professionals may impact mental state and hinder professional performance and quality of patient care (Li et al.[40], 2017). Previous research has explained that the increase in stress symptoms related to COVID-19 is related to psychological distress in frontline nurses.[41]

To overcome this situation, this study found that the team leader or manager made work shift arrangements regarding quality and quantity aspects and allocated more off-duty time to rest. The shifts and rest time arrangement were reported in a previous study on non-COVID settings by shortening the rotation periods of duty physicians or residents in the field of internal medicine to reduce fatigue.[42] In addition, the medical and surgical procedures performed contribute to a higher risk of being infected by COVID-19, and all HCWs in the department are at high risk of infection if they work 15 hours per day.[43] The strategy is also support another study which found that the working shift pattern needs to be scientifically structured and the allocation of labour should be rationally planned to optimize the allocation of nursing personnel, reduce their workloads, improve nursing quality and improve the physical and mental health of nurses during the COVID-19 pandemic.[44]

Another strategy for overcoming physical and psychological fatigue is to conduct regular screenings for health workers' physical and psychological conditions. These efforts are appropriate with WHO recommendations that HCWs take care of themselves physically and mentally through positive actions and realize that they may also be physically and mentally exhausted (WHO [45]). The importance of screening for physical conditions is based on the following reasons: to maintain the health and well-being of staff; to allow for the rapid identification and isolation of infected HCWs to protect patients as well as the wider community, bearing in mind that nosocomial infections serve as important reminders in the SARS and MERS epidemics.[46] In another study, it was stated that COVID-19 had a significant psychological impact on frontline nurses. Early detection of psychological disorders and supportive interventions according to related factors were carried out to prevent more serious psychological impacts on frontline nurses.[41]

The COVID-19 pandemic also created difficulties in conducting health education and assessments of patients and their families; many patients are resistant to the idea of COVID-19 through social stigma and patient dishonesty in delivering information. The acceleration of the spread of COVID-19 and its effects have made people fearful, panicked, concerned, and anxious.[47] Therefore, stigma appears as a socio-psychological disease.[48] In overcoming these obstacles, HCWs must educate patients continuously to reduce the existing stigma. Efforts to reduce stigmatization can be performed through cognitive-behavioural interventions or educational programmes.[49] HCWs in this study tried their best to provide psychological support to patients. Given the importance of psychological care for quarantined patients, professional training on psychological care and communication for healthcare providers can help to deal with patients' emotional problems.[50] However, we found that HCWs tend to hand over decisions to the family around continuing the patient's treatment if various efforts have been made. The misinformation conveyed by patients and their families has made HCWs always remind the family of the consequences of avoiding treatment.

There are also limited resources for dealing with other respiratory infections, such as Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Tuberculosis (TB) and influenza-like illnesses/respiratory infections.[36] Middle–low income countries also experience a limited resources of isolation rooms and other facilities in anteroom when dealing with TB.[51] A similar situation occurred when dealing with SARS in Hong Kong.[52] Previous studies results are in line with this study's results: that limited facility of isolation room and anteroom.

Various efforts are being made to overcome the above obstacles, such as diverting patients to network hospitals (hospitals that are capable and appointed by the government to provide care for COVID-19 patients), and building new rooms or modifying rooms by adding high-efficiency particulate air (HEPA) filters. The COVID-19 patients with mild to moderate symptoms[35] can be referred to a network hospital. In addition, SARS treatment rooms are expected to have

good ventilation and adequate distance between patients.[53] The use of HEPA filters to limit the spread of nosocomial diseases has been well documented and effective. This provides an effective filtration capacity for 99.97% of .1-micron particles.[54] HCWs agree that the availability of isolation rooms and anterooom is in accordance with standards (WHO, 2020); this is important in facilitating cross-contamination management and control.[36]

In this study, participants expressed concerns regarding the availability of PPE according to body size and standards. Several studies have also demonstrated the concern of HCWs about the adequacy of PPE and its suitability for performing the tasks.[55-57] As one of the efforts in this study to address the availability of PPE, several HCWs on duty also bought PPE independently which they thought was suitable for their body size and personal comfort.

The lack of availability of swab tools and lengthy diagnostic procedures also pose significant obstacles in handling COVID-19 patients. To overcome this problem, physicians carry out scoring tests to determine the need for a swab examination. This is support other sudy that stated cases without mild to moderate symptoms, no need to follow-up with RT-PCR examination.[58] COVID-19 sufferers without symptoms will have undergone independent isolation for at least 10 days. Patients with moderate to mild symptoms will have undergone isolation in a health facility with an extra 3 days free of symptoms.[35]

Limited personnel and skills of volunteers are also an obstacle in handling COVID-19, even though participants made efforts to provide direct guidance to volunteers to improve skills. The government carries out volunteer recruitment from the village level, such as social workers in charge of providing health education to the community, puskesmas (public health centres) for tracing implementation to referral hospitals as physicians and nurses. As an effort to increase the capacity of volunteers, the government also provides basic training on COVID-19[35]. However, this training has not been optimally implemented, so the volunteers still have limited skills.

Strength and Limitation of Study

This study has several strengths and limitations, such as that the hospital used in this study setting was in the same province, and the resources for handling COVID-19 may differ in other provinces in Indonesia. However, this challenge was also experienced by other countries based on studies conducted in the UK, China and the US.[15,18,19] Also, this article highlighted important lessons in overcoming the COVID-19 pandemic, health workers take part to educate the community in reducing stigma and hoaxes, prioritized PCR follow-up for patients with severe symptoms, optimizing the hospital network for patients who need hospital care and the willingness of health workers to continue to innovate in their efforts to meet treatment standards for COVID-19 patients.

This study was conducted without face-to-face meetings because a large-scale lockdown period was imposed at data collection time. Most of the interviews were conducted by telephone and a small part by video call which meant that the collection of non-verbal cues could not be completely carried out. Although the number of the sample between doctors and nurses was different, all participants represented all service units in the hospital, namely, ICUs, HCUs, Emergency Rooms (ER), and inpatient and outpatient care. This means that the results obtained show an overall picture of the participants' challenges in providing services.

Conclusion

In this study, several challenges faced by HCWs were documented, including difficulties in working, such as using PPE, difficulties in carrying out assessments, failure to properly carry out physical examinations and health education of patients and families, and physical and psychological fatigue due to working using PPE level 3 over a long time. HCWs can partially resolve this, but some problems require the support from government, hospital and also community.

The use of PPE, which aims to prevent transmission of COVID-19, poses challenges in carrying out medical treatment and nurse intervention. Some have made modifications based on their experience in the field. Online training is used to increase the knowledge and skills of nurses and physicians due to COVID-19. Arrangements for working hours and holidays are made to prevent the physical and psychological fatigue experienced by front liners treating COVID-19 patients. Difficulties in providing health education and assessments for patients and families occur due to resistance to and misinformation about COVID-19. Some problems require support from the government, public, and hospital managers to resolve pandemic preparedness and protect frontline HCWs. The government needs to pay attention to the adequacy of the number of trained health workers and prepare medical and non-medical volunteers, from training to special licencing procedures, especially during the COVID-19 pandemic. Meanwhile, it takes a long time to produce healthcare workers and cure the infected health workers.

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Ethical approval

Ethical approval and study permissions were obtained from the Commission for Ethical Health Research Dr Soetomo Hospital, Surabaya with certificate number 0034 / KEPK / VII / 2020 on July 27, 2020. Informed consent was signed by each participant before being interviewed and was coded to maintain anonymity.

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