



## **A MODEL-BASED PERSPECTIVES OF OCCUPATIONAL HEALTH AND SAFETY SYSTEM FOR FRONTLINER NURSES DURING COVID-19 PANDEMIC: A QUALITATIVE STUDY**

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### **ABSTRACT**

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Nurses are the front-line of health care providers, holding a vital role in serving patients during the COVID-19 pandemic. Their health and safety are thus of utmost importance. Therefore, developing proper protection procedures for nurses' occupational health and safety during the pandemic is necessary. The study aimed to explore an occupational health and safety system for nurses during the COVID-19 pandemic. This study used a qualitative descriptive method involving 15 participants from a regional general hospital that served as a referral hospital for 2 districts in the fight against COVID-19. These subjects were selected through purposive sampling. Data was collected using semi-structured, in-depth interviews conducted by telephone correspondence and recorded narration. The data were then analyzed using content analysis. The study's results revealed four main categories related to protecting nurses' health and safety during the pandemic, i.e., preventing exposure to COVID-19 infection, providing support for personal protection, managing personal protective equipment (PPE), and managing nurses' working hours. It is important to regulate the occupational health and safety system to ensure hospital nurses' safety. This measure has reduced the negative impact of the pandemic and maintained their safety at work.

#### **Keywords:**

COVID-19, Nurses, Occupational health, Qualitative, Safety system

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## BACKGROUND

Coronavirus Disease 2019 (COVID-19) is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus2 (SARS-CoV-2). SARS-CoV has never been previously identified in humans. Common signs and symptoms of COVID-19 infection include symptoms of acute respiratory distress such as fever, cough, and shortness of breath. The average incubation period of the virus ranges from 5 to 6 days, with the longest being 14 days (Ministry of Health, 2020). Severe cases of COVID-19 can cause pneumonia, acute respiratory syndrome, kidney failure, and even death. The disease was first detected in Wuhan, China, in December 2019 (WHO, 2020), and to date, the spread of the virus is growing rapidly at the world level. COVID-19 was declared a global pandemic by the World Health Organization (WHO) on 11th March 2020; over 118,000 cases have been documented in 114 countries, resulting in a death rate of 4,291 from the world population (WHO, 2020).

To date, COVID-19 cases in Indonesia continue to rise daily. This mirrors the global data on the number of confirmed cases of COVID-19 infection, marked at 287,008, with 214,947 recovered and 10,740 deaths (Ministry of Health Crisis Center, 2020). In Indonesia, the data on February 27th, 2023, at 3:12 pm, reported positive cases 6.735.628, recovered cases 6.57.187, and deaths 160.908. Bengkulu province had 752 confirmed cases, 37 deaths, and 501 recoveries (JHU CSSE Covid-19, February 2023). Based on data compiled by the IDI (Indonesia Doctors Association) Mitigation Team from the Indonesian Dentist Association (PDGI), the Indonesian National Nurses Association (PPNI), the Indonesian Midwives Association (IBI), the Association of Indonesian Medical Laboratory Technology Experts (PATELKI), and the Indonesian Pharmacists Association (IAI), since March as of December 2020, the total number of medical and health workers who died due to the infection reached 504 people. These consisted of doctors (237), dentists (15), nurses (171), midwives (64), pharmacists (7), and medical laboratory personnel (10) (Health Mitigation Team Liputan6.com).

Health workers at healthcare facilities are vital elements and resources for every country globally, so their health and safety factors denote fundamental concerns. This is obviously reasonable, considering that they provide continuous health care to patients and control the outbreak (Liu et al., 2020). This explains why health workers, especially doctors

and nurses, are at the forefront of battling COVID-19.

The importance of occupational health protection in the nursing sector during the COVID-19 pandemic is unquestionable. Comprehensive support should be given to ensure the nursing staff's welfare (Liu et al., 2020) and maintain their occupational safety and health (ILO, 2020). ILO (2020) contends that several possible steps are taken to ensure that nursing personnel are not exposed to special risks, including providing personal protective equipment, shortening working hours, extending breaks, and granting financial compensation when infection occurs (ILO, 2020).

Developing scientific and rational shift service schedules implies special attention to nurses during the COVID-19 pandemic (Huang et al., 2020). This is, of course, reasonable, considering that the increased number of patient admissions will result in a severe shortage of nursing staff. As such, an effective work schedule during the pandemic requires serious concerns.

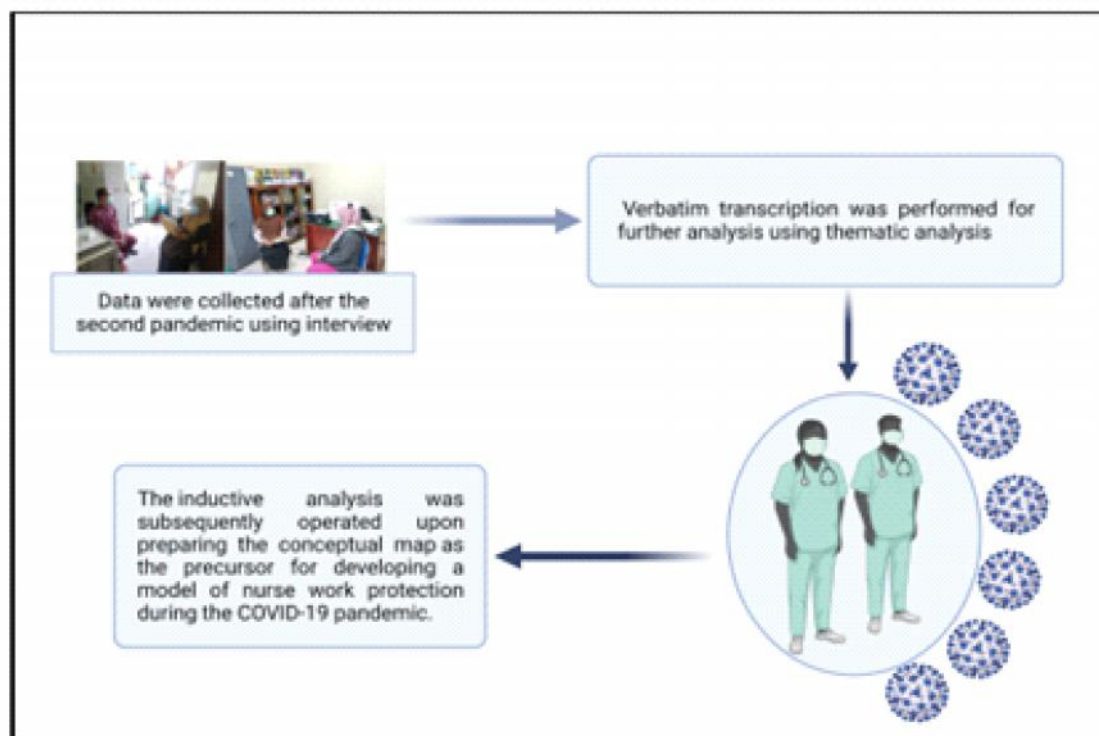
The regulatory model and adjustment of the work system effective during the COVID-19 pandemic needs to be researched despite extensive measures for implementation. Although the adjustment model can provide "opportunities" for nursing staff to obtain special protection, the possibility of infection in their work environment remains prevalent. Even so, this has to be kept to a minimum to maintain the effectiveness, productivity and professionalism of nursing. Therefore, this study aims to develop a model for ensuring the work safety of nurses in hospitals during the COVID-19 pandemic).

## METHODS

This study used descriptive qualitative research to investigate the natural perspectives of informants regarding the protection of nurses' occupational health during the COVID-19 pandemic in hospitals.

The participants in this study consisted of two groups: the field nurses and the nurse executives recruited using a proportional sampling from a general hospital that became a referral for handling COVID-19 in Rejang Lebong regency. The number of participants involved in this study was dependent on data saturation. However, by paying attention to the proportion of desired participant characteristics, the number of participants was based on gender, room unit, class of medical care, and education.

The data collection employed semi-structured



Figur 1. Schematic of data collection to identify the regulatory model for the occupational health and safety system for hospital nurses. This figure was created with BioRender.com under agreement number "MC253EKWOR."

interviews regarding the nurses' safety at work. This concern was investigated by asking the central question - how were the nurses protected during the COVID-19 pandemic in hospitals? The researchers developed the interview guideline and trialed it to two nurses with characteristics similar to the target participants. Upon recruitment, eligible participants were contacted directly by the research team and informed of the aims and benefits of the study. Afterward, the researchers asked for and obtained approval from the informants through semi-structured interviews. This recruitment was carried out via telephone, with recorded narration included to aid data collection.

Data collection was conducted after the second pandemic had escalated in June and July. This lasted from September to November 2021. Each participant was interviewed once for 20 to 30 minutes. The collected data was then transcribed verbatim to be analyzed using content analysis. The analysis resulted in a list of categories generated inductively as the basis for developing a thematic map. To ensure data reliability, the research design was consistently scrutinized for data saturation and flexibility.

The qualitative research instrument was the researchers themselves. We had the competence and experience in conducting qualitative research and expertise in the field of science under investigation. The researchers developed the interview instrument with

a prior trial of two representative nurses.

After data collection, verbatim transcription was performed for further analysis using thematic analysis. The analysis results were a list of themes or categories generated inductively from the data. The inductive analysis was subsequently operative upon preparing the conceptual map as the precursor for developing a model of nurse work protection during the COVID-19 pandemic.

Before data collection, the research ethics was obtained from the Bengkulu Ministry of Health Poltekkes, as granted in the Statement of Ethical Eligibility No. KEPK. M/148/09/2021. This Statement of Ethics remained valid from 7th September 2021 to 7th September 2022.

## RESULTS

The participants in this study were nurses who served in the emergency room (ER), operating theatre, Edelweiss section, Melati section, Teratai section, and ICU rooms. In addition, we involved the heads of the nursing division, procurement of goods division, and planning division. The participants were 12 people serving at the regional general hospital (RSUD) of Curup. In addition, we involved another 3 people for triangulation. The characteristics of all participants are described in Table 1.

Table 1. Participants Characteristics

Variables	M (SD)	N	%
Age	38.2	15	
<b>Gender:</b>			
Male		7	46
Female		8	54
<b>Religion:</b>			
Islam		15	100
<b>Education:</b>			
Diploma		4	21
Level-IV Diploma in Nursing		3	20
Certified Nurse		5	38
Bachelor of Public Health		1	7
Certified Pharmacist		1	7
Master of Public Health		1	7
<b>Occupations:</b>			
Field Nurses		6	40
Head of Rooms		6	40
Nurse Executive		1	7
Head of Procurement of Goods Division		1	7
Head Planning Division		1	7

Table 1 shows that the average age of participants is 38.2 years. Most are female (54%), all participants are Muslim, 33% are nurses, and 40% work as field nurses and heads of inpatient rooms.

Based on the views of several field nurses, the head of the room, the head of nurses, and other officers, four main categories concerning the protection of nurses' health during the COVID-19 pandemic at Curup Hospital came under the spotlight. These categories included preventing exposure to COVID-19 infection, providing support for personal protection, managing personal protective equipment (PPE), and setting nurses' work patterns.

### Theme 1: Preventing the exposure to COVID-19

Preventing exposure to Covid-19 infection led to using personal protective equipment (PPE) to avoid transmission. This was done by setting the screening sites for patients who had entered the emergency room. Special care was paid to the personal hygiene of post-treatment nurses.

The use of complete PPE is aimed at preventing exposure to COVID-19 infection. The use

of PPE was based on where each nurse had been assigned. The types of PPE used were level 1, level 2, and level 3. Complete PPE was used in the emergency room where the patient screening was carried out and in the confirmed COVID-19 treatment room. This is revealed from several participant statements as follows:

"... Clinics now require level-1 PPE." (P15)

"... The level-2 PPE has become routine, as the case of compulsory masks, face shields, aprons, examination gloves." (P2)

"The level-3 PPE consists of hazmat suit, 3-layer examination gloves, face shields, and KN95 masks. Yesterday we had the opportunity to wear N95 masks, but the stock was cut off." (P5)

"... N95 depends on the stock in the warehouse." (P1)

"... In the emergency unit, we were assigned as screening team. We used KN95 masks" (P2)

Screening patients entering the ER was meant to prevent exposure to COVID-19 infection. This was done in the screening tents, where initial

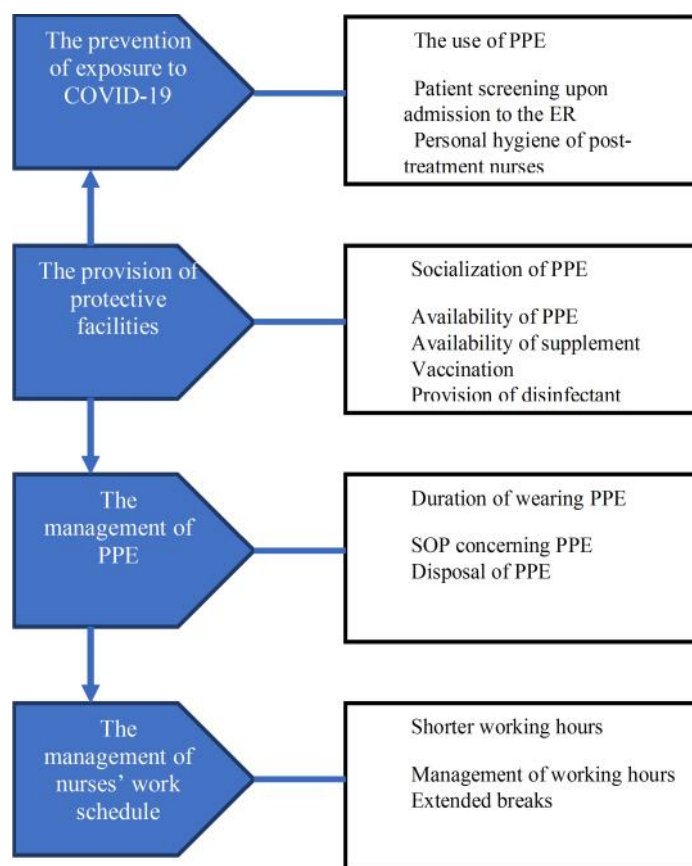


Figure 2. The Concept of Occupational Health and Safety System for Nurses at Hospitals during the COVID-19 Pandemic

examination was performed on patients by administering antigen and antibody swabs. Confirmed patients were included in the second screening tent with treatment from that place. Meanwhile, patients confirmed negative were immediately admitted to the emergency room to be treated according to their complaints. This is revealed from several participant statements as follows:

"In this COVID-19 pandemic, we manage screening and set up some screening tents ..." (P1),  
 "... So one tent is for screening, and another tent is for suspected patients who already had their laboratory results." (P2)

Personal hygiene of post-treatment nurses is an effort to prevent exposure to COVID-19 infection. Nurses' personal hygiene becomes increasingly crucial after their services, especially for confirmed patients. This is revealed from several participant statements as follows:

"We condition the room at the back for a bath..." (P1)  
 "There is a bathroom" (P6)  
 "We will get disinfected first. There is a place at the

back to change clothes" (P2)

"The nurses usually come here after they go inside and then clean themselves, to change clothes..." (P5)

"... There is a bathroom as well for changing clothes." (P10)

## Theme 2: The provision of facilities for occupational safety

The provision of nurses' occupational safety facilities consists of providing PPE, supplements, vaccinations, and disinfectants. The support provided by this hospital helped ensure the nurses' safety and comfort in carrying out nursing services. However, these supports had to be more optimal when they worked under a pressing workload. This posed an adverse impact on work-related stress.

The socialization of using and removing PPE was one of the initiatives to provide new knowledge, ensuring that everyone understood and implemented the procedure correctly. The urgency of knowing the correct use and removal of PPE determined their safety at work. This measure required organizational support. The PPI carried out the socialization by referring to the required standards. However, the socialization needed to be followed up by monitoring

and evaluating the correctness of PPE-related procedures, as reported by several participants.

"There was one request (on checking the procedure) from me myself here yesterday. From PPI, it was only one socialization ..." (P5)

"From the PPI team at the hospital to date, there was only one socialization. They said they planned another socialization, but it was never carried out." (P6)

"The socialization was initiated by PPI, once. That was at the outset of pandemic. They had informed the use of PPE..." (P11)

"... We had been given the video on how to do it or the correct SOP". (P5)

"There was a video shared via WhatsApp. It was the chairman of the room who shared it with the group." (P6)

"... We shared a video on how to remove PPE. properly. We shared it via WhatsApp groups." (P11)

The availability of PPE was one of the supports for nurses' personal protection. The impact of using and not using PPE was substantial for their safety. Providing optimal PPE through organizational support was very important to maintain a sense of safety for nurses. The following informants report this.

"It was not enough, but that was what we had because the supplies were limited. We used N95 by default." (P1)

"Current conditions depended on the needs of each nurse, but indeed, we provided complete support for those dealing with COVID-19 patients." (P14)

"... In the beginning, most of them received PPEs. Then in the middle of late 2020, because funds were limited, the complete PPE was only available in isolation room..." (P15)

The availability of supplements was one of the supports for self-protection. This was meant to help maintain nurses' optimal performance. Supplements were not given during normal conditions but during the COVID-19 pandemic. Increasing body immunity was essential in carrying out nursing services. Although not routinely and evenly, protein and vitamin supplements were given during the COVID-19 pandemic, as reported below.

"We got eggs and milk". (P1)

"... Yesterday, someone from the hospital provided food for nurses who took care of COVID-19 patients ...". (P6)

"... And we were also given multivitamins". (P1)

"The vitamins included complete vitamins C, B12, and Zinc. There was also pure vitamin C, depending on the availability at the pharmacy". (P2)

"... At least we were given vitamins, yet it was not complete ...". (P4)

Vaccination was one of the supports for nurses' protection. All nurses at Curup Hospital received vaccines 1 and 2, while the 3rd vaccination was only given to 90% of nurses at that time due to the follow-up schedule. This is informed by several participants as follows:

"I have been vaccinated 3 times..." (P1),

"Yes, for here, Alhamdulillah, all the nurses have been vaccinated, including the third dose of Moderna." (P5)

"I have had received vaccines 1 and 2, and yesterday I received the third vaccine." (P6)

"On average, there was a third vaccine, but some had not received it. On average, they had been confirmed with COVID-19." (P7)

The provision of disinfectants was one of the supports for self-protection for nurses after taking care of confirmed patients. Disinfectants were provided in each room, specifically for confirmed patients. As the informants indicated below, the disinfectants were used thoroughly before removing the PPE.

"... Here we do it (disinfection) by using a modified sprayer, such as that used for agriculture. It can be used for 1 room, but it cannot cover the entire room." (P5).

"... There was a room for removing PPE, and special sprayer for disinfection upon removal." (P6)

Screening carried out for nurses was one of the supports to maintain health as a form of protection for nurses, especially when symptoms occurred. Screening through the General Medical Check Up (MCU) was important during the COVID-19 pandemic. Screening of nurses at Curup Hospital focused on whether they tested positive or not through antigen and antibody swab tests. However, this was never a routine. Some of the informants confirmed this issue.

"In the beginning, there was screening. That was done every 2 months..." (P1)

"No, before the vaccination, there was screening." (P12)

"... So now we have to do it (screening) for those who feel they have been exposed to the virus. When confirmed, the nurse would have to go through screening ..." (P13)

"...But in 2022, there was hardly any screening" (P15)

### **Theme 3: The management of personal protective equipment (PPE)**

Using complete PPE when performing nursing services could interfere with work because it requires optimal health, or one might experience fatigue. Complete PPE was required for about 1-3 hours. Beyond this range, it can cause dehydration and fatigue, which result from an increased workload. Several participants acknowledge this.

"It depends. the longest is 1-3 hours..." (P2),

"... 2 hours of wearing hazmat is already tough, so every 2 hours ..." (P5)

The use and removal of complete PPE required an SOP affixed to the room. Improper use can result in exposure to COVID-19 infection, as some informants reported.

"...We had the SOP for the use of hazmat, to prevent contamination. It was useless to wear hazmat unless we also removed it carefully. This was absolutely crucial" (P2)

"... Now the SOP has been posted." (P12)

The disposal of PPE is meant to prevent the virus from being exposed to other nurses. PPE management was also done by disposing of PPE and patient body fluids in yellow garbage bags (for infectious waste). Some informants confirmed this measure.

"... So, for example, yellow bags were used to store patients' body fluids, but sometimes, when opened, they would be immediately put into a yellow plastic bag. However, there was a bucket to keep the bags together." (P3)

"... They were usually put in a yellow plastic bag." (P6)

"The minimum standard for disposal was that we had a yellow plastic bag. When we had PPE on, we would dispose it directly into the yellow plastic bag." (P11)

### **Theme 4: The management of nurses' work time**

The work time determines a nurse's schedule when carrying out nursing services. The morning shift consisted of 6 hours, and the night one lasted 12

hours. However, the long breaks in each shift after carrying out activities meant a shorter work time in each shift. This is reported by the informants below.

"The morning shift was 6 hours ..." (P1)

"The morning shift was 6 hours ... If you have worked, then you will have a lot of time to rest" (P2)

"Morning shift is 6 hours, but the break time is extended a bit " (P3),

"... The afternoon shift started from 2 to 8 o'clock." (P9)

"...the afternoon shift was approximately 6 hours, with rest for 1-2 hours." (P11)

"... Well, it was 12 hours during the night shift, ranging from 8 in the evening to 8 in the morning." (P4)

"... Night shifts were harder because it was 12 hours, just like the other schedules, but when we had enough members, we could take turns for taking breaks" (P5)

The management of the nurse's schedule was changing their work time in the COVID-19 room, sharing the assignment in the special room, and using complete PPE. Every 2-3 hours, there was a change between teams in the same shift. While working, they were monitored through a monitor screen, as well as the patients' and nurses' conditions. When finished, they would leave the room and work on completing the administration of patient reports. There were more personnel to deal with this workload. This was noted when we received the following information.

"... We took turns every 2 hours. If one cared for a patient for 2 hours, his PPE had to be immediately disposed of into a dirty bucket that had been prepared. Group 2 then came in, and every 2 hours we took turns" (P1)

"... The swap was meant to avoid all kinds of dehydration because 2 hours of using hazmat was already hard. For instance, the morning shift was from 8 to 10, and then 10 to 12 ..." (P5)

"The PPE was removed. When we were here, we would see how many patients we cared for and how many nurses were available. As such, to relieve stress and fatigue, they were allowed to stand by, say, for 3 hours. After that, another team took charge." (P6)

The nurses' vacation consisted of a day off after night duty and a 1-week vacation. After 6 days of service, they were usually given 1 day off, and those on night duty consecutively were given 2 days off. However, during the COVID-19 pandemic, a one-week vacation was given after 1 week of service, as confirmed by the informants below.

"In the ER, we still referred to the usual schedule. Every time we had done night shift, we would get a day off as usual" (P2)

"... Those after doing night shifts would get a day off ..." (P7)

"After we had done night shift, we would have a day off" (P8)

"For the vacation from September 2020 until now, we got a week off ..." (P5)

"There was 1-week off" (P6)

## DISCUSSION

This study describes a model of nurses' occupational safety system during the COVID-19 pandemic. The results of this study describe the measures devoted to that objective from September to November 2021. These were the 3rd to 6th month of the outbreak in Rejang Lebong regency after the Task Force for the Acceleration of Handling COVID-19 announced the confirmation of the first case in the regency on 2nd March 2020, before peaking in June 2021.

The research findings describe four main categories related to adjusting the nursing work system in hospitals during the COVID-19 pandemic. These included preventing exposure to COVID-19 infection, supporting personal protection, managing personal protection (PPE), and setting nurses' schedules. A review of the nursing safety protection model based on the perspective of field nurses and nurse executives portrays a safe and comfortable environment. Room managers and hospital directors have also acknowledged this finding as they reported extensive prevention, provision, management, and regulation mechanisms to protect nurses during the COVID-19 pandemic.

The prevention of COVID-19 infection is taken by nurses when dealing with patients. The prevention has three sub-themes, including the use of PPE, sorting/screening of patients entering the ER, and monitoring the personal hygiene of post-treatment nurses; the use of personal protective equipment (PPE) is different at each level of PPE, which is adjusted to where the nurse is assigned. Various types of PPE are used to protect nurses during the COVID-19 pandemic, depending on the location, the target officer, the patient, and the type of activity (Ministry of Health, 2020).

Standard PPE when treating COVID-19 patients involves a surgical mask - well fitted to block splashes and droplets of large particles; an N95 mask,

which must be tightly sealed around the nose and mouth, and examination gloves that should be tear-resistant, leak-resistant, biocompatible, and fit on hand. Required equipment involves latex rubber, polyvinyl chloride (PVC), nitrile, polyurethane, surgical gloves, disposable gowns, medical coveralls, shoe covers used once only, goggles, face shields, heavy-duty apron made of single-use plastic or high-quality reusable plastic material, and waterproof boots, possibly to cover up to calf if the dress does not cover the lower body. These equipment ranges are made of rubber or waterproof material or coated with waterproof cloth. They can be reused only after disinfection (Ministry of Health, 2020).

Screening of new patients entering the ER is intended to discover the COVID-19 cluster by setting up several tents to find confirmed or unconfirmed COVID-19. Initial screening is done by taking antibody and antigen swabs. Sorting is intended to identify early symptoms and prevent the risk of nurses being exposed during their assignments. Areas prepared to receive suspected patients must be equipped with all necessary PPE. All patients must wear a medical mask. It is important to limit the number of healthcare professionals who come into contact with confirmed or suspected cases of COVID-19. It is better to form a special team of health professionals who treat suspected or confirmed cases to minimize the risk of transmission (Feroli, 2016).

Nurses' personal hygiene after COVID-19 treatment necessitates them to clean themselves after removing PPE to prevent the risk of exposure due to possible errors in removing PPE. What is more, standard personal hygiene activities must be carried out when dealing with confirmed patients. Maintaining personal hygiene and health is important for nurses in providing health services, especially during the COVID-19 pandemic. When starting and ending services, nurses have to be clean because they are required to clean themselves before leaving the hospital (Asmaningrum et al., 2021)

The institution provides self-support to protect the nurses during the COVID-19 outbreak. These supports include providing PPE, supplements, vaccinations, SOP for new patient admissions, disinfectants, and nurse screening management.

Personal protective equipment used during the COVID-19 pandemic is specifically intended to prevent the infection. This also includes making explicit the benefits and procedures for nurses to use and remove PPE. However, socialization needs to follow clear standards. Health workers are advised to use full PPE. The use of PPE for nurses still needs



to be viewed as suboptimal (Yanti et al., 2021). To that end, more well-structured socialization is absolutely necessary.

The availability of PPE in a hospital plays a vital role as it ensures the security and comfort of nurses during the pandemic. The nurses' need for PPE to prevent infection must be addressed well for optimal security. The availability of adequate PPE denotes a key component to nullify the threat of infection (Dedeh Hamdiah & Ernawati Umar, 2021)

The distribution of supplements is organizational support in increasing nurses' immunity upon carrying out their duties to care for patients during the pandemic. The immunity affects their performance while preventing the infection.

Vaccination given to nurses aims to increase their immunity when carrying out care for patients during the COVID-19 pandemic. In every health service, the availability of vaccines needs to be warranted. Organizational monitoring of vaccine distribution to nurses is imperative to support its performance, as mirrored by nurses' performance.

New patients admitted to the hospital during the COVID-19 period need to be immediately tested for possible infection. Generally, they do not know about the symptoms of a disease. Accepting new patients, especially in the emergency room, requires clear standard operating procedures during the pandemic.

Disinfectants are meant to clean nurses from the threat of COVID-19 infection. The facilities in the COVID-19 inpatient room are sterilized immediately before and after carrying out treatment, which represents a standard for nurses' personal hygiene in maintaining exposure. Hospitals need to draw serious attention to the facilities in each area and ensure immediate access to disinfectants as well as the availability of disinfectant rooms. Thorough spraying specifically designated for COVID-19 rooms is an absolute necessity.

PPE used to prevent exposure to COVID-19 infection requires special attention because the absence of control would amplify the possibility of infection. PPE management includes paying attention to the duration of using PPE, the SOP for using and removing PPE, and disposal of PPE.

PPE during the COVID-19 pandemic has been set in such a way that it poses a minimum risk to the nurses' immune system when used. The use of PPE when carrying out treatment on confirmed patients demands strong immunity. A nurse's stamina when wearing complete PPE lasts around 2-3 hours, beyond which dehydration would occur.

The use and removal of PPE have to be well taken into account. The standard for this issue provided by the organization can reduce the exposure to COVID-19 and possible infections due to the errors upon wearing or removing PPE.

During the COVID-19 outbreak, used PPE has to be disposed of in containers with yellow labels. These labels are important for garbage collectors. To maintain their health, nurses' compliance in disposing of PPE properly is needed.

The nurses' work pattern manifests a rhythm in carrying out their performance in each shift. The arrangement of the nurse schedule includes shortening work hours, managing shifting mechanisms, and increasing vacation duration.

Service time is correlated with fatigue at work. Nurses in COVID-19 confirmed rooms are given shorter working hours during shifts and longer breaks. The availability of more nurses allows shorter service time.

Working hours can possibly result in fatigue at work. Therefore, time management provides a good opportunity to reduce work stress. This is carried out between nursing personnel alternately. Good work practices allow nurses to take more control in stressful working conditions, such as during this COVID-19 outbreak (Asmaningrum et al., 2021)

Nurses' vacation during the COVID-19 pandemic has to be well-adjusted to ensure optimal recovery after being engaged in stressful conditions due to extra workloads during the pandemic. The extended vacation provides comfort for nurses and families. Changes in the work cycle during the pandemic are carried out by reducing the frequency of nursing assignments and extending their days off. This change aims to ease the workload of nurses during the pandemic. It is assumed that a regular work cycle will cause more stress and fatigue on the part of nurses (Asmaningrum et al., 2021).

This research has garnered data from the informants' reports and proposed four research themes.

## CONCLUSION

A model-based perspective of an occupational safety and health system for nurses during the COVID-19 pandemic consists of four categories garnered from the data describing the protection of nurses' occupational health and safety during the COVID-19 pandemic. These include preventing exposure to COVID-19 infection, providing support for personal protection facilities, managing personal pro-

ective equipment (PPE), and regulating nurse work patterns. Protection helps reduce the impact of exposure to COVID-19 infection and increases a sense of security while reducing nurse anxiety. This can affect nurses' productivity at work and improve their performance.

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