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Implementation of Occupational Health and Safety Risk in Muhammadiyah Palembang Hospital During the COVID-19 Pandemic

Ahmad Ghiffari*, Syahrul Muhammad, Ardi Artanto, Febri Putri Lintang Sari
Universitas Muhammadiyah Palembang, Indonesia
** Correspondent Author: dokter.ghi@gmail.com*

ABSTRACT
Hospitals are workplaces with multiple hazards that can cause health impacts for employees. On May 12, 2020, at the Muhammadiyah Palembang hospital (RSMP), 21 out of 29 medical personnel tested confirmed positive for COVID-19. It is essential to know how the implementation of K3RS in RSMP contains the pandemic. The cross-sectional descriptive observational with a total sampling method, with samples of the workers of RSMP. The questionnaire to 88 respondents was further univariate analyzed. The results with the category percentage of proper, sufficient, and poor on performing adequate PPE were 19,3%, 65,9%, and 14,8%; on washing hands 0,2%, 72,7%, and 17%; on social distancing 47,7%, 37,5%, and 14,8%, respectively. Based on the profession, the proportion of those who apply suitable PPE, wash their hands thoroughly, and performed social distancing by outpatient doctors were 50%, 90%, and 70%; by outpatient nurses were 75%, 62.5%, and 75%; by ER doctors were 50%, 66.6%, and 60%; by emergency room nurses were 85.7%, 71.4%, and 42.8%; by laboratory personnel were 75%, 70%, and 75%; by radiology officers were 62.5%, 75%, and 50%; by pharmaceutical officers were 60%, 80%, and 60%, respectively. It is recommended to build sufficient infrastructure to enhance the K3RS program.

Keywords: Workers, Health Profession, Hand Washing, Infectious Diseases, Epidemic

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BACKGROUND

At the end of December 2019, there were reported pneumonia cases with unknown etiology (Li *et al.*, 2020). January 7, 2020, China identifies pneumonia of unknown cause as a new type of coronavirus (SARS-CoV-2) as a mutation of the SARS and MERS viruses (Hu *et al.*, 2020). On January 30, 2020, the World Health Organization (WHO) declared the novel coronavirus pneumonia a Public Health Emergency of International Concern (PHEIC), and on March 11, 2020, WHO declared COVID-19 a global pandemic (Petrosillo *et al.*, 2020). Occupational Health and Safety (K3) is an effort to guarantee safety and improve workers' health status by preventing accidents and occupational diseases, controlling hazards in the workplace, health promotion, treatment, and rehabilitation, including against the worldwide pandemic (Kurniati, 2019).

Hospital (RS) includes the criteria of a workplace with various hazards that can cause health impacts, not only to the direct actors who work in the hospital but also to patients and hospital visitors (Ristiono dan Azkha, 2009). The hospital management should implement K3 efforts at the hospital (Ramdan dan Rahman, 2018). During the epidemic period of COVID-19 or other infectious diseases, the implementation of infection prevention and control (PPI) is crucial in health service settings, especially the importance of personal protection for health care workers (PERDOKI, 2020). On May 12, 2020, at the Muhammadiyah Palembang hospital (RSMP), 21 out of 29 medical personnel tested positive for COVID-19 by the swab PCR (Palembang, 2020). It is essential to know how the implementation of K3RS in RSMP contains the COVID-19 pandemic.

METHODS

The research uses a descriptive method, which was conducted from October to December 2020. The population was outpatient and ER doctors, outpatient and ER nurses, laboratory technicians, radiologists, and pharmacists who worked at RSMP, with a total sampling method. Research variables were personal protective equipment (PPE) (Magdaria, 2017), hand washing implementation (Septiani, 2016), and Social Distancing (Pinasti, 2020); obtained based on the results of respondents' questionnaires in the inclusion criteria at the Muhammadiyah Palembang hospital where prior informed consent was obtained as a sign of their willingness to be a sample in the research that was to be done.

This research was analyzed univariate. The data were presented in narrative form, a proportion distribution table to assess the implementation of occupational safety and health at Muhammadiyah Palembang hospital by looking at the respondents' questionnaire answers via a google form. Ethical clearance number obtained from the Faculty of Medicine Universitas Muhammadiyah Palembang, 63/EC/KBHKI/FK-UMP/XI/2020.

RESULTS AND DISCUSSION

Eighty-eight respondents in the research were analyzed univariate. The report included ten out of thirty outpatient doctors. The sample involved sixteen out of twenty outpatient nurses. Twelve of the nineteen emergency room doctors took part in the experiment. The study featured seven out of fourteen emergency room nurses. All of the lab staff replied to the google forms document, and so das the radiology personnel. Fifteen out of twenty-five pharmacists participated in the study. Univariate analysis is in Tables 1 to 3, while deeper analysis based on the professional distribution is presented in Tables 4 to 10.

Table one to three shows that 19.3% applied Proper PPE, 65.9% applied PPE according to their profession, and 14.8% still did not apply PPE. In table 2, it is found that 10.2% have firmly applied hand washing, 72.7% applied hand washing, and 17% still lacked

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hand washing. Table 3 shows 88 respondents of RSMP staff who worked actively during the COVID-19 pandemic. As many as 47.7% apply social distancing, 37.5% apply social distancing, and 14.8% still do not apply social distancing. The RSMP staff partially applied PPE according to their profession and lacking in applying proper PPE. This is probably due to the limited availability of PPE at the time, in the early stage when COVID-19 hit (PERDOKI, 2020). The use of PPE on health workers in the hospital aims to protect the skin and mucous membranes from the risk of exposure to blood, body fluids, secretions, excreta, intact skin, and mucous membranes from patient to staff and vice versa (WHO, 2020). Most of the RSMP staff have implemented the importance of implementing hand washing during the COVID-19 pandemic. Hand hygiene serves to prevent infection, colonization of patients and prevent contamination from the patient to the patient's environment treated, staff, and health workers' work environment in the hospital. (BNPB, 2020) The workers have implemented social distancing to reduce the transmission of disease spread. Health facilities can help maintain distance between people and other health workers by making unique markers using paint/stickers/duct tape to create physical distance between people (Suppawittaya, Yiemphat dan Yasri, 2020). The 1-2 meter queue distance between people, registration counters, or cashiers with the location of the patient standing or queuing, chairs between patients in the waiting room, service room, between the patient's chair and the examiner's desk, the pharmacy room between the counters for receiving prescriptions or administering drugs with the location of the patient standing (Pradana, Casman dan Nur'aini, 2020). The finding describes the incidence cause of transmission from COVID-19 on RSMP staff in the first place (Palembang, 2020).

Table 4 shows ten outpatient doctor respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 30%, 50%, and 20%; 0%, 90% and 10%; 70%, 20% and 10% . Most of the outpatient doctors of RSMP had applied proper K3RS. The outpatient doctor used PPE as recommended while on polyclinic (WHO, 2020). PERDOKI has explained the PPE used by outpatient doctors and outpatient nurses who work actively in the hospital, namely work clothes according to hospital regulations, surgical isolation gowns, N95 respirators, goggles/face shields, medical gloves, and closed shoes (PERDOKI, 2020). They are aware of the importance of washing hands and carrying out proper handwashing to prevent the spread of SARS-CoV-2 in the polyclinic. Nonetheless, no outpatient doctors implement complete hand washing. This is probably due to a sink's unavailability in each poly, and only hand rub is available (Zanardo *et al.*, 2020). Most outpatient doctors have implemented social distancing as recommended. In the consultation room, a separation sign was mounted between the doctors and the patients and between the waiting seats. They have attempted to cut off the transmission of COVID-19 in the exam room and waiting room (Morawska dan Cao, 2020).

Table 5 shows sixteen outpatient nurse respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 6.25%, 75% and 18.75%; 12.5%, 62.5% and 25%; 75%, 12.5% and 12.5%. Most of the outpatient nurses of RSMP had applied proper K3RS. They used PPE as recommended while on polyclinic (WHO, 2020). PERDOKI has explained the PPE used by outpatient doctors and outpatient nurses who work actively in the hospital (PERDOKI, 2020). They have implemented hand washing as recommended by WHO. Only a few of them had not applied hand washing, probably due to sinks' unavailability in each polyclinic and only hand rub is available. They have also attempted to cut off the transmission with social distancing through signs in chairs and used of barriers.

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Table 6 shows twelve ER doctors respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 33.3%, 50% and 16.6%; 16.6%, 66.6%, and 16.6%; 41.6%, 50% and 8.3%. Most ER doctors have conducted proper K3RS. They used PPE as recommended by the PERDOKI, which is quite similar to the outpatient doctors. The PPE for ER doctors and nurses are the work clothes according to the hospital requirements, surgical isolation gown, N95 respirator, goggles, double-layer gloves, and closed shoes (PERDOKI, 2020). In a standard isolation room with negative pressure, the PPE is work clothes according to hospital regulations, surgical masks, closed shoes (PERDOKI, 2020). Most of the ER doctors have applied hand washing as recommended by WHO. They also have implemented social distancing during the COVID-19 pandemic. The ER doctor should stop the transmission of SARS-CoV-2 while in the emergency room (Suppawittaya, Yiemphat dan Yasri, 2020).

Table 7 shows seven ER nurse respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 14.2%, 85.7%, and 0%; 14.2%, 71.4% and 14.2%; 42.8%, 28.5% and 28.5%. Most ER nurses have conducted proper K3RS. They have been wearing PPE as recommended, that none of them apply it poorly. Most ER nurses have implemented hand washing as recommended by WHO, although not all. The supported by the availability of a sink can enhance the percentage. They have implemented social distancing during the COVID-19 pandemic. The ER nurse must stop the transmission of SARS-CoV-2 while in the emergency room (Pradana, Casman dan Nur'aini, 2020).

Table 8 shows twenty laboratory technician respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 15%, 75%, and 10%; 10%, 70%, and 10%; 15%, 75%, and 10%. The laboratory technicians have conducted proper K3RS, both the dry and the wet lab personnel. Standard use of PPE on dry lab personal who take throat swabs is work clothes according to hospital requirements, surgical isolation gown, N95 respirator, goggles, medical gloves, and closed shoes. In comparison, the wet lab personal standard PPE who work on Bio-Safety Cabinet (BSC) are laboratory coat, N95 respirator, head cap, medical gloves, and laboratory shoes. Most of the laboratory workers have implemented hand washing as recommended by WHO, although not all. No handwashing applications in laboratory installations are available, except the hand rub. Most RSMP laboratory staff have implemented social distancing. There is already a barrier between laboratory staff and patients when giving and collecting specimens and between waiting chairs, not to mention the given sign for distance (Suppawittaya, Yiemphat dan Yasri, 2020).

Table 9 shows eight radiologist respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 25%, 62.5%, and 12.5%; 12.5%, 75% and 12.5%; 37.5%, 50% and 12.5%. The radiologist has to conduct proper K3RS. They have mostly worn PPE as recommended by the PERDOKI. The recommended PPE are work clothes according to the hospital's requirements, surgical isolation gown, N95 respirator, goggles, face shield (if taking medical intervention), medical gloves, and closed shoes (PERDOKI, 2020). According to the risk analysis of the activities carried out (Redmond et al. 2020), additional personal safety equipment, such as the head cap. Most radiologists have implemented hand washing as recommended by WHO, although not all. Not all of the handwashing applications in radiology installations are available, except the hand rub. Most of the RSMP radiology officers had implemented social distancing. There is a barrier between the officers and the patients in the radiology area and between the patients' waiting chairs.

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Table 10 shows fifteen pharmacist respondents regarding the category of proper PPE, washing hand, and adequate social distancing, respectively. Distribution number are 20%, 60% and 20%; 6.6%, 80% and 13.3%; 60%, 13.3%, and 26.6%. still do not apply social distancing. The pharmacist has to conduct complete K3RS. They have used PPE as recommended by the PERDOKI and are supported by the availability of a sink near the pharmaceutical installation. According to work activity risk analysis, PPE standards are surgical masks or other masks and gloves. If the activity is carried out in an isolation room, PPE follows the PPE standards in the isolation room with personal (PERDOKI, 2020). The pharmacists have implemented handwashing accordingly. The close distance between the sink and the pharmacy installation can make it easier for pharmacists to wash their hands. Most pharmacists have applied social distancing. In the drug store, there is a barrier between the pharmacist and the patient, including between the waiting chairs amongst patients.

There are a few limitations to the analysis, such as incomplete details and the pandemic's study period. Missing data for some hospital health personnel reflect not the complete condition of health care settings. Attitude towards personal protection equipment, handwashing behavior, and social distancing was in the early phase of the pandemic, which might be changed by now.

CONCLUSION

The implementation of K3RS at RSMP during the COVID-19 pandemic was quite good. A small group of medical staff did not apply K3RS, increasing the spread and transmission of COVID-19. It is recommended to build sufficient infrastructure to enhance the K3RS program.

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ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 377-384

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Table 1. Distribution of Respondents Based on the Application of PPE (N=88)

PPE application category	Frequency (n)	Percentage (%)
Proper	17	19.3
Sufficient	58	65.9
Poor	13	14.8
Total	88	100.0

Table 2. Distribution of Respondents based on Handwashing Implementation (N=88)

Handwashing application category	Frequency (n)	Percentage (%)
Proper	9	10.2
Sufficient	64	72.7
Poor	15	17.0
Total	88	100.0

Table 3. Distribution of Respondents based on Social Distancing (N=88)

Social distancing category	Frekuensi	Percentage (%)
Strong	42	47.7
Sufficient	33	37.5
Poor	13	14.8
Total	88	100.0

Table 4. Distribution of Respondents' Profession as Outpatient Doctors (N=10)

Category	Outpatient doctors					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	3	30	0	0	7	70
Sufficient	5	50	9	90	2	20
Poor	2	20	1	10	1	10
Total	10	100.0	10	100.0	10	100.0

Table 5. Distribution of Respondents' Profession as Outpatient Nurses (N=16)

Category	Outpatient nurses					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	1	6.25	2	12.5	12	75
Sufficient	12	75	10	62.5	2	12.5
Poor	3	18.75	4	25	2	12.5
Total	16	100.0	16	100.0	16	100.0

Table 6. Distribution of Respondents' Profession as ER Doctors (N=12)

Category	ER Doctors					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%

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Proper	4	33.3	2	16.6	5	41.6
Sufficient	6	50	8	66.6	6	50
Poor	2	16.6	2	16.6	1	8.3
Total	12	100.0	12	100.0	12	100.0

Table 7. Distribution of Respondents' Profession as ER Nurses (N=7)

Category	ER Nurses					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	1	14.2	1	14.2	3	42.8
Sufficient	6	85.7	5	71.4	2	28.5
Poor	0	0	1	14.2	2	28.5
Total	7	100.0	7	100.0	7	100.0

Table 8. Distribution of Respondents' Profession as Laboratory technicians (N=20)

Category	Laboratory technicians					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	3	15	2	10	3	15
Sufficient	15	75	14	70	15	75
Poor	2	10	4	20	2	10
Total	20	100.0	20	100.0	20	100.0

Table 9. Distribution of Respondents' Profession as Laboratory technicians (N=8)

Category	Laboratory technicians					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	2	25	1	12.5	3	37.5
Sufficient	5	62.5	6	75	4	50
Poor	1	12.5	1	12.5	1	12.5
Total	8	100.0	8	100.0	8	100.0

Table 10. Distribution of Respondents' Profesion as Pharmacist (N=15)

Category	Pharmacist					
	PPE application		Hand washing		Social distancing	
	f	%	f	%	f	%
Proper	3	20	1	6.6	9	60
Sufficient	9	60	12	80	2	13.3
Poor	3	20	2	13.3	4	26.6
Total	15	100.0	15	100.0	15	100.0