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Controlling the risk of covid-19 transmission among hospital healthcare workers in Bima

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A B S T R A C T

COVID-19 has deeply disturbed the world with the confirmation of 318.6 million positive cases in the world. There have been 14.1 thousand deaths and 4.2 million confirmed positives in Indonesia; the most common cluster of death cases is healthcare workers (HCw), with a total of 2066 cases. This type of research is qualitative research with an exploratory descriptive design. The number of participants in this study is 12 people. The findings of this study revealed that there was excessive transmission in HCw, and one of the hospitals was temporarily closed because more than 20 HCw tested positive for COVID-19. In the psychology sub-category, there is still a level of stress felt by HCW dealing with COVID-19, and there is still a lack of special attention given to the anxiety and stress levels of these patients by hospitals. In the preventive care sub-category, the problem is that some hospitals still do not have OSH experts, so the risk assessment process and occupational health services are not carried out. As for the sub-category of medical device availability, further studies are still needed in terms of the health system, especially in the availability of health devices in dealing with pandemics and other health-related disasters.

Kata kunci:

Pengendalian Risiko
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A B S T R A K

Covid-19 sudah sangat meresahkan dunia dengan konfirmasi kasus 318,6 juta orang positif diseruh dunia. Di Indonesia terdapat 14,1 ribu meninggal dan 4,2 juta terkonfirmasi positif, kasus meninggal yang mendominasi adalah klaster tenaga kesehatan dengan jumlah 2066. Jenis penelitian ini adalah penelitian kualitatif dengan rancangan deskriptif eksploratif, jumlah narasumber dalam penelitian ini adalah 12 orang. Hasil penelitian ini menemukan adanya penularan berlebihan pada tenaga kesehatan, bahkan ada salah satu rumah sakit yang tutup sementara karena lebih dari 20 tenaga kesehatan terkonfirmasi positif covid-19. Pada sub kategori psikologi masih terdapat tingkat stress yang dirasakan oleh tenaga kesehatan yang menangani covid-19 dan masih kurangnya perhatian khusus pada kecemasan dan tingkat stress tenaga kesehatan oleh rumah sakit. Pada sub kategori preventif, masalahnya ada pada beberapa rumah sakit yang masih belum memiliki tenaga ahli K3, sehingga proses penilaian risiko dan serveilans kesehatan kerja tidak dijalankan. Sedangkan untuk sub kategori ketersediaan peralatan medis masih perlu kajian lebih lanjut dalam hal sistem kesehatan, terutama dalam ketersediaan perlatan kesehatan dalam menangani pandemi dan bencana lain terkait kesehatan.

INTRODUCTION

Data from the official website of the World Health Organization (WHO) in 2022 states that more than 5.5 million people have died and more than 318.6 million people have tested positive for COVID-19 worldwide (WHO, 2022). In Indonesia, there were 14.1 thousand deaths and 4.2 million confirmed positive Covid-19s in January 2022; while this is a small percentage of deaths, it is necessary to increase early vigilance in Indonesia to prevent new variants from emerging from various countries (Kementerian Kesehatan RI, 2022).Positive cases of COVID-19 have been reported in West Nusa Tenggara Province (NTB), with a total of 27,8 thousand cases, 1493 cases in Bima Regency (Corona NTB, 2022), and 57 deaths (Covid 19 Kota Bima, 2022).This number of cases will greatly impact the increased risk of COVID-19 transmission to health workers in NTB; please note that COVID-19 can spread very quickly and infect people around it (Hutapea & Nilawati, 2021).

According to data on the Lapor Covid-19 site in Indonesia, there are 2066 healthcare workers (HCw) who died while on duty; the most dead HCw were doctors with a total of 730; based on regional maps, the HCw who died on duty were most in East Java province with a total of 643; in NTB province, no data has been found by researchers on the number of HCw who died or were exposed to Covid-19; however, from this condition, it should be a valuable lesson for every region in Indonesia to pay more attention to and protect HCw in their region (Lapor Covid-19 RI, 2022).

Hospitals need to carry out early detection for the prevention of COVID-19 because hospitals are one of the places at high risk of transmission (Nida et al., 2020). Not only do hospitals have a high risk of transmission, but they also have a high risk of work accidents (Ramdan & Rahman, 2018). In some rooms and when patients enter and exit, periodic checks are carried out so that they can be known based on the symptoms of detection by the health department. Patient sorting related to infection is important to detect the initial symptoms of COVID-19 (Rina et al., 2021). Detection is not only carried out when the patient is confirmed positive; in several rooms, including the emergency room, it is necessary to be aware of the level of transmission (Ramdan & Rahman, 2018).

We cannot underestimate the transmission of COVID-19 because the many methods of transmission and our ignorance of COVID-19 make us need to be careful in carrying out care for patients (Akbar et al., 2020). The transmission of COVID-19 is mostly through droplets, viruses that transmit through the air (aerosols), and can also be through health care facilities in hospitals (CDC, 2020). The virus will always develop and spread from respiratory droplets, and it will then be and survive for some time on any equipment or material (Service, 2020), including a medical device.

Controlling the transmission of COVID-19 requires not only the awareness of HCw but also the awareness of the surrounding community. According to the Centers for Disease Control and Prevention (CDC), which recommends people use cloth masks, that's in contrast to recommendations for HCW, who have differing views on mask use (Eikenberry et al., 2020). People are confused about the exact rules for wearing masks for activities due to differences in views from health researchers (Marasinghe, 2020), as well as HCw.Apart from the policy of wearing masks, some people have also begun to realize their importance in stopping the spread and transmission of COVID-19 by wearing masks (Goldberg et al., 2020).

The Indonesian government designated Covid-19 as an occupational disease in the Decree of the Minister of Health (KMK) number HK.01.07/MENKES/327/2020, demonstrating that the government wants the labor sector to generally receive specific protection due to the transmission of Covid-19, and HCw in particular are at the forefront of dealing with Covid-19 (Kementerian Kesehatan RI, 2020). in the community, the government has also implemented several policies such as large-scale social restrictions during the pandemic (Peraturan Pemerintah RI, 2020).

This study is specifically for HCw because they have a greater risk of exposure to COVID-19 caused by a history of direct contact with COVID-19 patients (Santoso, 2021). HCw are one of the workers who require special attention related to their duties and positions in serving patients and the community because they are very vulnerable to disease transmission, especially the transmission of COVID-19, so they are needed to take care of themselves in this case by implementing health protocols while carrying out their duties (Akbar et al., 2020).

Because every hospital is required to implement Occupational Safety and Health (OSH) hospitals (Peraturan Kementerian Kesehatan RI, 2016), hospital agencies as places where HCw work must be able to carry out risk management and the provision of occupational health services.

METHOD

This type of research is qualitative with a descriptive design that is exploratory; exploratory descriptive is chosen to find the root of the problem at the time of the study (Moleong, 2018). By conducting in-depth interviews and field observations, researchers become the primary data collection instrument. Participants in the study were 4 people from each hospital; in each hospital, 2 participants from OSH management or aligned would be taken, and the other 2 were HCW who had contact with and/or treated COVID-19 patients. There were a total of 12 participants from the three hospitals.

The purposeful sampling technique was used in this study. The implementation of this research was carried out in August 2022 for one month. Data analysis is carried out using thematic analysis; this analysis emphasizes more on sorting the themes from the results of in-depth interviews to understand the patterns and meanings of information in interview and observation data (Liamputtg, 2009). It is first done by transcribing the meaning of the entire in-depth interview, then selecting the interview transcript that corresponds to the sub-category of each variable and doing manual coding on several interviews that fit the research topic. The observation is carried out when HCW wants to carry out treatment for COVID-19 patients and/or in several rooms that have a high potential for transmission and/or rooms that often experience contact between HCW and patients.

RESULTS

Participants' Characteristics

The gender distribution of participants in this study was 33.3% male and 66.7% female, while the average age of participants was 32.3. Most of the interviewees' job types are

nurses who have been involved in the care of COVID-19 patients. In the 3 hospitals that were used as research sites, only one hospital had OSH experts. Hospitals that do not yet have OSH experts are replaced by participants with an Infection Prevention and Control (IPC) and/or Health Environment Practitioner (EHP) team in the hospital.

Table 1.
Participants' Characteristics

Code	Age (Years)	Sex	Job Type
N1	28	Male	Covid-19 Nurses
N2	31	Female	Covid-19 Nurses
N3	29	Female	EHP
N4	40	Female	IPC
N5	37	Female	Covid-19 Nurses
N6	25	Male	Covid-19 Nurses
N7	32	Female	OSH Committee
N8	41	Male	IPC
N9	30	Female	Covid-19 Nurses
N10	29	Female	Covid-19 Nurses
N11	27	Female	IPC
N12	39	Male	EHP

Risk Manajement Covid-19

The results of the in-depth interview analysis for the Covid-19 risk control sub-category include:

"kalau ada pasien positif itu, sebelum positif PCR kita ada namanya ruang antara, sambil menunggu positif betulan berdasarkan SWAB PCR kita tempatkan dulu disitu. Dulu itu untuk SWAB PCR itu harus menunggu dulu dari provinsikan karena keterbatasan alat PCR itu ya kita menyiapkan ruang antara itu..."(N4)

"If there is a positive patient, before we are positive for PCR, there is an antara room. While waiting for the positive to happen based on the PCR SWAB, we place it there first." "Because of the limitations of the PCR tool, SWAB PCR had to wait from the province in the past; yes, we prepared an antara room for it." (N4)

Koding; SWAB antigent positif to antara rooms, SWAB PCR takes a long time, isolasi room, at the beginning of covid-19 there was no PCR

The results of the in-depth interview analysis for the risk identification Covid-19 sub-category include:

"Fakor risiko yang paling banyak itu di ruang UGD sama di ruang... ruang UGD, Poli, sama di ruang Isolasi itu ya... yang paling tinggi ada di ruang isolasi faktor risikonya. Jadi di situ kita apa namanya... ini ya memetakan map risiko Covid, nah inikan dengan tiga ruangan itu yang risiko tertinggi itu ada di Covid-19 jadi semua orang tidak boleh lewat di situ kecuali petugas yang memakai APD"(N7)

"The most risk factor in the space is in the same ER room... the ER room, Poly; the same in the isolation room, yes... The risk factor's isolation room has the highest concentration. So that's where we're called... this is yes, mapping the COVID risk map, and well, with those three rooms, the highest risk is in COVID-19, so everyone except officers wearing PPE should not pass through there." (N7)

Koding; Risk factor, emergency room, poly and isolation rooms, risk mapping, restricted passing

The results of in-depth interview analysis for the psychological hazard sub-category include:

"Terus terang saya cemas ya, dulu sempat tiap hari itu banyak yang meninggal, udah banyak masyarakat yang tidak percaya, tapi itu kita tetap bekerja, dan yang meninggal itu ada di tim kita itu. Sempat tutup UGD ini rumah sakit dulu karena lebih dari 20 orang kalau nda salah terpapar itu.... Kita dulu minta bantuan dari luar tenaganya baru dibuka lagi"(N3)

"Frankly, I'm anxious; yes, in the past, every day, a lot of people died; there were already many people who didn't believe it, but we still worked, and the dead were on our team. It had first closed the ER in the hospital because it had infected more than 20 people if you were exposed to it incorrectly. We used to request assistance from outside the power, and then it was closed again. "(N3)

Coding; Anxious, many died, distrust of the community, continued to work, one of the health workers died, closed the ER, more than 20 health workers were exposed

The results of in-depth interview analysis for the communication and consultation sub-categories include:

"Tetap komunikasini, semua lintas sektor itu kita koordinasikan tu dengan pemerintah desa setempat maupun dengan aparat jika ada yang menolak tindakan dari kita, eee karena masyarakat tu gitu...."(N5)

"We continue to communicate; we coordinate all cross-sectors with the local village government and with the authorities if anyone refuses our actions, because the community is so..."(N5)

Coding; Communication, coordination, rejection of actions by society.

Occupational Health Care

The results of in-depth interview analysis for the health promotion sub-category include:

"kita membuat poster-poster dulu membuat leaflet untuk membagikan ke tenaga kesehatan terus ke keluarga pasien itu ada, kita tempel-tempel juga di dinding-dinding rumah sakit ada itu"(N11)

"We make posters first and make leaflets to distribute to health workers and then to the patient's family, we paste it also on the walls of the hospital there is it"(N11)

Coding; Posters, leaflets, distributed, pasted.

The results of in-depth interview analysis for preventive care sub-categories include:

"Kita kemarin kalau nda salah bulan februari ya anu 2021 pertama vaksin itu namanya sinovak, sekarang sudah ke 3, dan sepertinya mau masuk vaksin ke 4 nanti..." (N2)

"We are yesterday, if I'm not mistaken, in February 2021, the first vaccine was called Sinovac, now it's the 3rd, and it seems that you want to enter the 4th vaccine later..."(N2)

Coding; Vaccine, sinovak, boster dose

The results of in-depth interview analysis for the curative care sub-category include:

"Saya kalau punya gejala tetap saya laporkan dan ijin pulang, kemarin pernah dan sering bergejala itu, teman-teman juga banyak sekali yang yang seperti itu dan kita di SWAB tiap minggu, itu prosedurenya pak.....banyak yang positif, jumlah pastinya ada di lab."(N5)

"If I have symptoms, I still report them and get permission to go home. Yesterday I was and often have symptoms; there are also a lot of people who are like that, and we are in SWAB every week; that's the procedure, sir.... many are positive; the exact number is in the lab."(N5)

Coding; Have symptoms, reported, permission to go home, swab test every week

The results of in-depth interview analysis for the rehabilitative care sub-category include:

"Kita sudah biasa pak ya, teman kita yang positif lalu negatif lagi kita tetap bersama dan memberi dukungan lagi. Ya kan itu bagian pekerjaan ya, jadi kita ini sudah banyak yang positif apa pernah positif termasuk saya...."(N8)

"We are used to it, sir, our friends who are positive and then negative again, we stay together and give support again. Yes,

that's part of the job, yes, so we've had a lot of positives what's ever been positive, including me...."(N8)

Coding; Adapt, support, have tested positive for Covid-19

Medical Devices

The results of in-depth interview analysis for the sub-category of medical device management include:

"Kita kelola peralatan medis itu dengan langsung dibuang ya, jadi ada memang tenaga kesling yang buang itu, dan itu digunakan saat eee tetap pakai APD ya untuk prosesnya itu.....ya dibuang ketempat tertutup dan ada nanti yang ambil disitu gitu"(N11)

"We manage the medical equipment by throwing it away immediately, so there are indeed EHP who throw it away, and that eee still use PPE for the process.....ya is thrown into a closed place and someone will take it there."(N11)

Coding; Medical device for covid patients is immediately disposed of, EHP, using PPE, disposing of them in a closed / tightly covered place.

The results of in-depth interview analysis for the sub-category of medical device availability include:

"...untuk penanganan Covid ini sempat dari RSUP yang dateng karena kekurangan oksigen saat itu iya jadi dari ee apa namanya dari RSUP, tim RSUP tim Covid nya RSUP dateng ke sini ee yang mengecek apa ee persediaan oksigen karena dulu tu banyak sekali pasien-pasien yang tidak tertolong karena kekurangan oksigen itu"(N7)

"... for the handling of Covid, it was from the RSUP which was dated because of lack of oxygen at that time, yes so from ee what is the name of the RSUP, the RSUP team of the Covid team at RSUP came here ee who checked what ee oxygen supply because in the past there were so many patients who were not helped because of the lack of oxygen"(N7)

Coding; Lack of oxygen, monitoring/checking from RSUP, many patients die due to lack of oxygen

PPE Observation

The results of observations on the willingness of medical device and PPE levels during the Covid-19 pandemic from each hospital where the study was conducted were based on the table 2.

Table 2.
Observation of PPE availability for each hospital

Types and Levels of PPE / Hospitals	HS A	HS B	HS C
Headcape	Available	Available	Available
Face Shield	Not Available	Available	Not Available
Eye Shield	Available	Available	Available
Surgical Mask	Available	Available	Available
N95 Mask	Available	Available	Available
Coverall	Available	Available	Not Available
Gown	Available	Available	Available
Gloves	Available	Available	Available
Boot	Available	Available	Not Available
Level PPE	Level 3	Level 3	Level 2

The results of observations on the use of personal protective equipment in each room in hospitals throughout Bima City and Regency use 45 points based on the number of rooms and types of PPE provided, the use of room-based PPE is calculated based on the presentation of each room in 3 hospitals in Bima City and Regency, the results can be seen in figure 1 below.

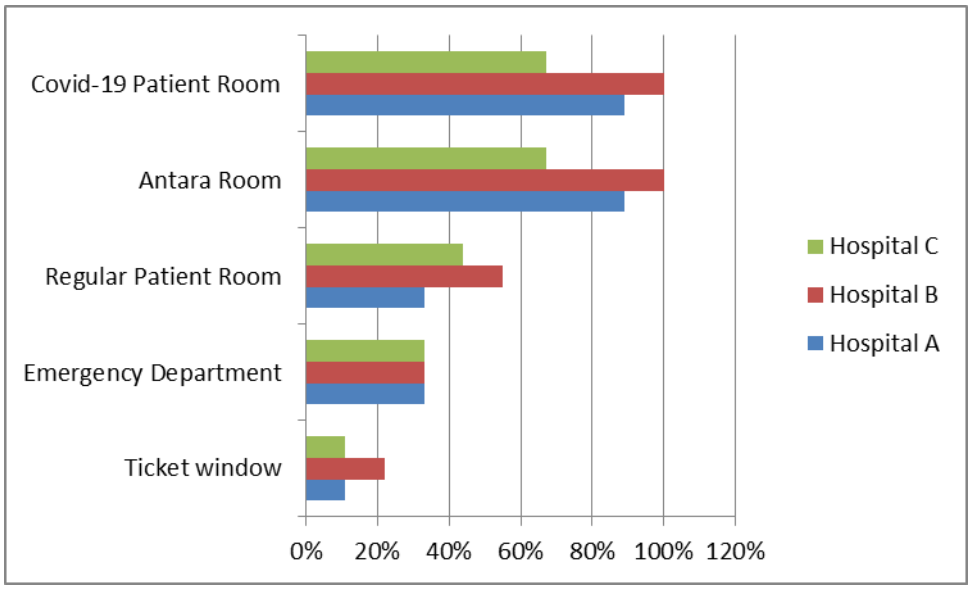

Figure 1. Presentation of the Use of PPE in Each Room

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DISCUSSION

Risk Management Covid-19

Based on the results of in-depth interviews for the risk control sub-category, it was found that there was a social distancing behavior with patients and HCw in the hospital environment; this can be used as a basis for minimizing the incidence of disease transmission (Liao et al., 2010) because social distancing in crowds can be applied when the threat of disease transmission is higher (Qazi et al., 2020). At the beginning of Covid-19, hospitals prepared an intermediate space to wait for PCR results from the province due to PCR limitations. After the PCR tool was owned by the hospital, HCw carried out PCR SWAB examinations every week to control the distribution. The advantage of using this SARS-CoV-2 special RT-PCR was that it was timely and had better accuracy than other RT-PCR, so that if periodic tests were carried out, it could identify and minimize the transmission of Covid-19 (Aranha et al., 2021). In every COVID-19 room, hospitals install CCTV to see the progress of patients; the use of technology can help surveillance and care carried out by nurses (Gooding & Clifford, 2021).

To deal with the risk of COVID-19 infection in the emergency room, hospitals should implement multilevel rooms and distinguish patients based on the symptoms suffered (Bianco et al., 2020).COVID-19 risk mapping has been implemented in Hospital B's area to facilitate control measures based on the identification of existing risks.Risk mapping can help in the control and tracking of high-risk places (Sa & Sa, 2013), especially in hospitals.

In the psychological hazard analysis, there is anxiety in HCw because many patients and other HCw are exposed and die. In some hospitals in Bima City and Regency, HCw are supported and strengthened by each other; this can prevent psychological risks that develop in HCw (Sharma et al., 2020). The interview results also revealed that using PPE for too long caused HCw to overheat and stress; this result also demonstrated that HCw in this case nurses who used PPE for more than 8 hours had a much higher level of stress than those who used it for a short period of time (Hoedl et al., 2021).

In the results of the communication and consultation sub-category interviews, several communications were found between HCw and outsiders, especially when there was a rejection of medical measures by the community. Communication during the COVID-19 pandemic was very new to be implemented, but the alternative solution was to mobilize the participation of high-quality medical experts as the main mediators (Zhang, 2022). In addition to involving medical experts, Another thing to consider is communication training for HCw, with the goal of ensuring that patients understand what is being communicated (Anderson et al., 2019).

Occupational Health Care

According to the findings of interviews in the health promotion sub-category, there is an availability of immune-boosting vitamins for HCw; hospitals provide this vitamin every day for HCw, especially those who carry out treatment for COVID-19 patients; some literacy revealed that the use of vitamin C can help minimize the risk of transmission of COVID-19 (Colunga Biancatelli et al., 2020), from the results also found that there are prevention posters provided and shared by hospitals, strategy, especially the distribution of posters can be a reference for HCw in promoting health knowledge to the public and their colleagues (Thorpe et al, 2022), hospitals in Bima city and regency have also prepared handwashing stations or sinks provided in every corner of the hospital, the provision of this handwashing is of great benefit, especially for hand hygiene and health investment in the future (Ray, 2020)..

The results of interviews for preventive care found that all HCw have been vaccinated with booster doses and, on average, will be ready to carry out the booster 2 vaccine. Please note that booster vaccine doses are used for patients who are vulnerable to the risk of COVID-19 and/or those who have a high risk of exposure (Anonimous, 2020). The results also show that there are some hospitals that do not yet have OSH experts, even though OSH experts are very important, especially in terms of risk assessment and specific measures for preventing and controlling exposure to the virus in HCW in hospitals (Chirico & Magnavita, 2021).

Curative care carried out in the hospital environment is the implementation of PCR tests for hospitalized patients who have symptoms of COVID-19. Each hospital employee chooses to report the symptoms they receive using social media and takes the initiative to conduct a PCR test. These results are also in line with research from (Iversen et al., 2020), which says that more than half of them choose to report the symptoms they feel.

Rehabilitative care for HCw in every hospital do not exist, especially for Covid-19, but there is positive support from other HCw and families for those who have been confirmed positive, so that confirmed HCw do not feel depressed by this and consider it as a risk to their work, social support and or colleagues can be a solution to minimize stress levels in them (Woon et al., 2021) (Alnazly et al., 2021).

Medical Devices

The management of medical devices at Bima City and Regency hospitals prepares closed rooms to replace PPE after duty. The replaced PPE is taken by EHP while still using PPE during the disposal process; this is in line with the waste management guidelines in the hospital, which say that every waste collection officer must be equipped with PPE (Kementerian Kesehatan RI, 2020).

The availability of special oxygen-specific medical devices for patient care had experienced a shortage; this was in the second period of COVID-19, where every Asian hospital, especially those in Indonesia, experienced a significant shortage of oxygen supply (Bikkina et al., 2021). Some countries also felt the impact of scarcity and high oxygen prices (Ortiz-Prado et al., 2021). PPE at the time of the first confirmed patient did not exist and was still being used by HCw themselves. The shortage of PPE only occurred during the early days of COVID-19 because the health system had not been able to deal with the pandemic disaster, especially COVID-19 (Mahendradhata et al., 2021) (Barasa et al., 2020).

PPE Observation

Based on observations of the completeness of the use of PPE in each hospital's COVID-19 patient room, Hospital A uses PPE to an extent of 89%, Hospital B is 100% complete, and Hospital C is 67% complete. The lack of completeness of PPE is due to its minimal availability in hospital C; this result is in line with research from (Key et al., 2020) reporting that 52.4% of nurses report inadequate PPE. Researchers' observations are far from perfect because they see the completeness of their use of only one visit in each hospital

room, and limited time with interviews is also why researchers are not in the observation room every day. Observation of the use of PPE in the room of COVID-19 patients is carried out when HCW want to visit COVID-19 patients and do not enter during the examination.

LIMITATION OF THE STUDY

This study is limited to three categories, each category has several sub-categories, the sub-categories are selected by researchers who are concerned with controlling the risk of Covid-19. The three categories include: 1) Knowing the implementation of Risk Management of Covid-19 (Risk Identification, Risk Control, Communication and Consultation and Psychology), 2) Knowing the implementation of Occupational Health Care (Health Promotion, Preventive care, Curative care, and Rehabilitative care), and 3) Knowing the implementation of Medical Devices (Management and Availability of Medical Device).

CONCLUTION AND SUGGESTIONS

The results of this study found better efforts in every hospital in Bima City and Regency, especially in the sub-categories of risk control, risk identification, communication and consultation, health promotion, curative care, rehabilitative care, and medical device management. As for the results that are still lacking, they are in the sub-categories of psychology, prevention care, and availability of medical devices. The psychology sub-category still has a level of stress felt by HCW dealing with COVID-19, and there is still a lack of special attention given to the anxiety and stress levels of these patients by hospitals. In the preventive care sub-category, the problem is that some hospitals still do not have OSH experts, so the risk assessment process and occupational health services are not carried out. As for the sub-category of medical device availability, further studies are still needed in terms of the health system, especially in its handling of pandemics and other health-related disasters, especially in Indonesia.

Hospitals that do not yet have OSH experts are expected to be able to train or recruit OSH experts in general so that they can carry out disease protection and prevention processes, especially for HCw. Hospitals that already have OSH experts are expected to be able to improve disease prevention and control and identify factors that can hinder the performance of HCW.

Researchers feel that the topics in this study are still common and divided into several multiple sub-categories, so further research is needed to determine more in-depth results in each sub-category in several hospital risk control categories.

ETHICAL CONSIDERATIONS

This research has received ethical approval from the College of Health Sciences (STIKes) Guna Bangsa, with number 033/KEPK/VIII/2022. This ethical approval is the basis for researchers to carry out research. Without this ethical approval, researchers have not been able to conduct health research.

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Conflict of Interest

This research is fully funded by the Indonesian Ministry of Education and with the support of STIKes Yogyakarta where the researcher works, the researcher feels that for the time being there is no binding conflict of interest in the implementation of this publication, because its implementation is still ongoing. Researchers will remain focused on completing responsibilities as recipients of funding, so that in the future there will be no conflicts of interest that occur.

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