

THE WORKLOAD IMPACT ON HEALTHCARE WORKERS AT THE HOSPITAL IN COVID-19 ERA: A SYSTEMATIC REVIEW

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Abstract: COVID-19 has been declared a worldwide pandemic by WHO on 11th March 2020. The aim of this study was to collect data and investigate across the world in dealing with the load of healthcare workers on their healthcare systems to get a better understanding of the real difficulties and challenges they faced. This study is a systematic review, searched some literatur of PUBMED, PROQUEST, OXFORD JOURNAL, WILEY JOURNAL and SCOPUS journal databases published in 2020. We used the keywords; "Workload" and "healthcare workers" and "COVID-19", and screened by inclusion and exclusion criteria. Nine studies have screened from 673 articles from database, which investigated factors independent of the workload of the healthcare workers and explaining the strategy of hospitalis in overcoming the healthcare workers workload in COVID-19 era. We found several factors related to the workload of health workers in the COVID-19 era: using the PPE, lack of knowledge about disaster management, the type of professional group, increasing the number of COVID-19 patients and the rapidly progress of patient severity. Changing the flow of patient services is one of pursuing a strategy to reduce the workload by put the screening at the first step of patient arrival to the hospital.

Keywords: Workload; Healthcare Workers; COVID-19.

INTRODUCTION

COVID-19 has been declared a worldwide pandemic by the World Health Organization (WHO) owing to the rapid increase in the number of cases, on 11th March 2020. The WHO recorded 81,159,096 confirmed cases of COVID-19 and 1,791,246 fatalities as of 15:00 on December 31, 2020, and that figure was rising (<https://covid19.who.int/>, n.d.). The number of COVID-19 cases is also escalating rapidly in Indonesia. By 31 December 2020, there were 743,198 confirmed cases in 34 provinces and 22,138 people had lost their lives (<https://covid19.go.id/peta-sebaran>, n.d.). Indonesia is currently in a serious position, with the world's twentieth-highest amount of cases and mortality. Indonesia have not leave the first wave since the first case on March 2020 where the other countries on the world are going to their second wave of pandemic (<https://covid19.who.int/>, n.d.). Indonesia are struggling to reduce active cases from 8074 cases daily and mortality rate which are 3% (<https://covid19.go.id/peta-sebaran>, n.d.). The absence of a uniform, transparent, and comprehensive tracking system detecting COVID-19 infections in Indonesians has become a major issue in the fight against the pandemic (<https://kawalcovid19.id/content/1294/serial-data-virus-korona-2-rasio-lacak-isolasi-rli-dan-korelasinya-dengan-kematian-kumulatif#reach-skip-nav>, n.d.).

The fast spreading pandemic has put a lot of stress on the entire Indonesian healthcare system, especially in government hospital as referral hospital at each Provinces. In these early stages of the

outbreak, most ICU isolation units were overwhelmed by the growing number of suspected and confirmed cases; general wards were quickly converted to isolation wards, and health-care providers without COVID-19 patients were treated by infectious disease experts (ICU Jakarta Menipis, n.d.).

The pandemic places healthcare workers all across the world in a situation that has never happened before. Healthcare workers are on the front lines of the COVID-19 pandemic response and are particularly vulnerable to infection. Europe had the largest number of COVID-19 infections among health-care workers (119,628 cases, or 78.2%), whereas Africa had the lowest number (1472 cases, 1.0%). In terms of mortality, the same geographical trend emerged: Europe had the largest number of deaths (712, or 50.4 percent), while Africa had the lowest (17 death, 1.2 percent). Despite having the highest number of fatalities, Europe also had the highest number of illnesses, resulting in the lowest Case Fatality Rate. The greatest Case Fatality Rate (5.7 fatalities per 100 infections) is found in the Eastern Mediterranean, followed by South East Asia (3.1 deaths per 100 infections) (Bandyopadhyay S, Baticulon RE, Kadhum M, Alser M, Ojuka DK, Badereddin Y, n.d.). As 21 of December 2020 Indonesia has lose 518 their healthcare workers (2,3%) (<https://nakes.laporcovid19.org/>, n.d.).

During the COVID-19 pandemic, all provinces reported an increase in healthcare worker workload, placing them at a higher risk of infection and disease transfer to their families and

coworkers(NEWS - dob Cl. Ini Alasan 24.400 Pasien Positif Covid di Klaster Rumah Sakit. NEWS - dob, n.d.). One of the most common ways for the corona virus to spread throughout the world is through hospital-associated transmission (Yuki Furuse, Eiichiro Sando, Naho Tsuchiya, Reiko Miyahara, Ikkoh Yasuda, Yura K. Ko, et al. Cluster of Coronavirus Disease in Communities, Japan, n.d.).

As a result, we decided to undertake a research to learn from other nations' experiences in overcoming the burden of healthcare workers on their healthcare systems in order to gain a better knowledge of the genuine issues and obstacles they faced. Our findings will be a useful resource for establishing safer healthcare providers who can respond more quickly and methodically to future outbreaks.

MATERIALS AND METHODS

This review used the protocol of the reporting items for Systematic review and Meta-analysis (PRISMA) guideline.

Eligibility

The articles were screened by inclusion and exclusion criteria. The inclusion criterias were a article just in English language, published in 2020, articles about COVID-19 focusing in the workload impact on healthcare workers at the hospital in some countries. The exclusion criterias were lack of information on target outcome, unable to download and there was no method on research.

Information Sources and Search

A number of 673 articles were

collected from PubMed, PROQUEST, Oxford Journal, Wiley Journal, and Scopus databases using Excel 2013 version 2020. We collected the relevant article which the topic and then we screened them by inclusion and exclusion criteria. The detailed screening process is described in FIGURE 1.

Study Selection

We filtered the total list of identified record articles to determine standardized and eligibility. Initially, we screened the articles via title and abstract. Afterward, eliminated the irrelevant articles from the study. And next we reviewed the full-text of articles and include them to the list. We discussed about incompatibility and compare the articles.

Data Collection Process

Two authors finished an outcome data base to review. And one authors extracted the next articles from the included studies. The last one authors corrected the extracted data and any disagreements were reviewed by him.

Data Item

The following information will be extracted from each the articles : Journal title, author, publication year, study design, Variable (the healthcare workers working in the front line of the COVID-19 pandemic, the healthcare workers experience negative and positive mental symptom before and during the COVID-19 crisis).

Risk Of Bias In Individual Studies

The checklist of Joanna Briggs Institute (JBI) critical appraisal was used to assess the methodological quality. We have seven articles using cross-sectional study and two articles using qualitative analysis.

RESULTS AND DISCUSSION

This systematic review demonstrates factors that influence the workload of healthcare workers in COVID-19 era, incorporating two studies across six countries. A number of nine articles have screened from 673 articles from database (PubMed, PROQUEST, Wiley Journal, Oxford Journal, and SCOPUS) . Ten articles excluded because duplication. 663 articles will be screened by title and abstract and we got 179 articles that relevant. 25 full-text articles assessed for eligibility. And the nine articles were study primer. The detailed screening process is described in FIGURE 1.

Study Characteristic

Of the 9 identified studies, one study included non-medical participants, 8 studies conducted a survey of the healthcare workers. 4 studies were conducted in China, the remaining were conducted in south Sudan, Iran, Saudi Arabia, Brazil, and Belgium. The demographics of study participants varied. The Cross-sectional design was used in 7 studies and Qualitative analysis was used in 2 studies. All the studies rely on questionnaires and survey. In table 1, we summarize the characteristics of this study. These 9 studies investigated factors independent of the workload of the healthcare workers. Several studies explaining the strategy of hospitalis in overcoming the healthcare workers workload in COVID-19 era.

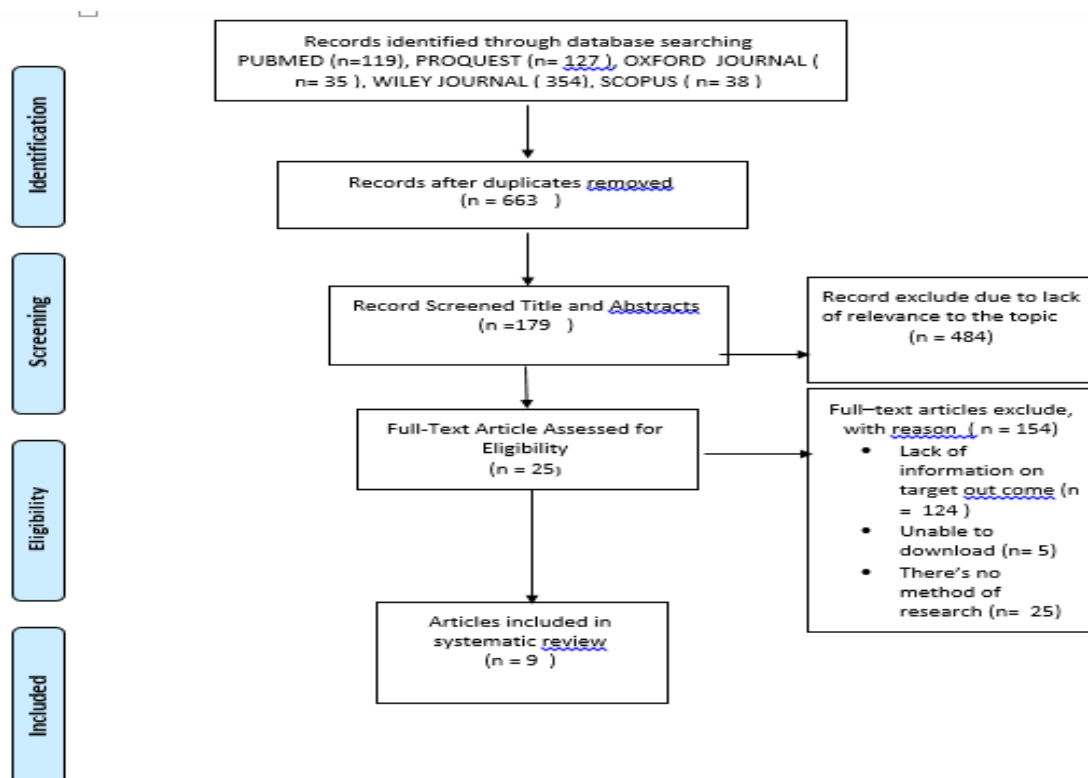


Figure 1. Prisma Flow Diagram

Table 1. Study Characteristic

No.	Title	Date of Study	Authors	Location	Method	Variable (Participants)	Result	Others Information
1.	Coping with COVID-19 in United Nations peacekeeping field hospitals: increased workload and mental stress for military healthcare providers	April 2020 - August 2020	Yongxue Zhang, D Xiang, N Alejok	Wau city- South Sudan	Cross-sectional study	62 personnel at the UN level II Hospital (april 2020 – august 2020) 1. Healthcare workers = 47 medical staf (22 doctors, 17 nurses, 8 technicians/pharmacist) 2. Non-medical duties = 16 personnel	→ The hospital : there has been a change in the triage system in hospital since the Covid-19 case. → the workload healthcare workers: "an increase in workload due to : increased working hours, increased mental stress, limited health facilities and human resources, especially healthcare workers.	→ During the COVID-19 era, the workload of hospital cleaners increased. The change of hospital triage and protocols service are one of the factors in increasing the workload for cleaning workers.
2.	Covid-19 effects on	(2020)	Esmail Shoja,	Iran	cross-sectional	The healthcare workers worked in	The workload increases at : →the healthcare workers	

	the workload of Iranian healthcare workers		Vahideh Aghamohammadi, Hadi Bazayar, Hamed Rezakhani Moghaddam, Khadijeh Nasiri, Mohammad Dashti, Ali Choupani, Masoumeh Garaee, Shafagh Aliasgharza deh and Amin Asgari		study	Iran ministry of health and medical education (495 participants). The subjects of sociodemographic information : "sex, age, shift working, job title, duration of employment, interacting with Covid-19 patients at work, Due to the extreme incidence of Covid-19, working hours have risen, ward of labor	who are in direct contact with Covid-19 patients →the use standard PPE also increases the workload →Long shift time (12 hours) increases fatigue and workload compared to 8 hours shift →the type of job also affects the workload. Nurses have a higher level of workload than doctors, because nurses have more duties according to this study.	
3.	Experiences of front-line nurses combating	26 January 2020 – 5	Yu-E Liu, Zhong-Chang Zhai, Yan-	China	Descriptive qualitative analysis	15 nurses (5 males, 10 females) from 2 hospitals and working history	→the workload healthcare workers: Their lack of knowledge	support from the society for the nurses during

	coronavirus disease-2019 in China: A qualitative analysis	February 2020	Hong Han, Yi-Lan Liu, Feng-Ping Liu, De-Ying Hu		with the interviewed semi-structured	was 5-7 years. 7 nurses worked in ICU, 2 nurses work on infectious disease wards, 6 nurses worked on general wards	and abilities in emergency catastrophe rescue are variables that impact it, as well as psychological pressure.	COVID-19 pandemic make them more excited doing their job.
4.	Healthcare workers experience in dealing with Coronavirus (COVID-19) pandemic	Marc 2020 and April 2020;	Rana H. Almaghrabi, MD, MBBS, Huda Alfaradi, MD, Wejdan A. Al Hebshi, BSc, DipIC Mohammed M. Albaadani, BSN, RN	Saudi Arabia	Cross-sectional study with questionnaire-based online survey	1036 Healthcare workers. > respondent's age were 26-34 years.	Healthcare workers have a strong commitment in carrying out the responsibility of treating COVID-19 patients. They need support especially in crisis management program to deal with disasters. Problems that often arise related to their workload are the additional shift, use PPE, and mental burdens for fear of contracting and having to be far from their family	The positive role of social media in making awareness for society.
5.	Healthcare	2020	Paula	Brazil	Cross-	→536 the	→at the start of the	→the setting

<p>Workers in Brazil during the COVID-19 Pandemic: A Cross-Sectional Online Survey</p>		<p>Cotrin, Wilana Moura, Caroline Martins Gambardela -Tkacz, Fernando Castilho Pelloso, Lander dos Santos, Maria Dalva de Barros Carvalho, Sandra Marisa Pelloso, and Karina Maria Salvatore Freitas</p>		<p>Sectional Study → the observer's assessment A Google Forms (Google Inc., Mountain View, CA, USA) questionnaire was created and sent through email and WhatsApp (WhatsApp Inc, Mountain View,</p>	<p>healthcare workers in Brazil (doctors, nurses, dentists) → above the age of 22 → battling the COVID-19 epidemic on the front lines</p>	<p>pandemic many dentists and nurses wanted to give up their jobs. → The fear of contracting COVID-19 was expressed by 90% of respondents → The majority of healthcare personnel were not trained to treat individuals who were suspected of being infected with the coronavirus. →almost all the healthcare workers complain of difficulty sleeping</p>	<p>of work lack study are variety from private clinical practice to public health sector. Causing of the workload on physician and dentist lower than nurses</p>
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					CA,USA)			
6.	Hospice care self-efficacy among clinical medical staff working in the coronavirus disease 2019 (COVID-19) isolation wards of designated hospitals: a cross-sectional study	from February to April)	Ze-hong Zheng, Zhong-chen Luo, You Zhang, Wallace Chi Ho Chan, Jian-qiong Li, Jin Pang, Yu-ling Jia and Jiao Tang	China	cross-sectional study with questionnaire survey	A large number of the healthcare workers who handle COVID-19 patients. →The mean age was 32.96 ± 5.96 years	Healthcare workers who have the competence, knowledge, skills for pandemic problems will be better prepared to carry out their duties and can reduce their mental burden due to being faced with death.	-

7.	COVID-19 is having a destructive impact on health-care workers' mental well-being	2 April 2020 and 4 May 2020	Kris Vanhaecht, Deborah Seys, Luk Bruyneel, Bianca Cox, Gorik Kaesemans, Margot Cloet, Kris Van Den Broeck, Olivia Cools, Andy De Witte, Koen Lowet, Johan Hellings, Johan Bilsen, Gilbert Lemmens and Stephan Claes	Belgium	cross-sectional Study → Workers in the healthcare industry were invited to take part in a two-wave online survey	→the healthcare workers in Belgium →survey online about : before and during the COVID-19 crisis, people had negative and positive mental symptoms.	→there was an increase in negative mental health symptoms during the COVID-19 era.	
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8.	Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study	from 13-24 february 2020	Deying Hu, Yue Kong, Wengang Li, Qiuying Han, Xin Zhange, Li Xia Zhu, Su Wei Wan, Zuofeng Liu, Qu Shen, Jingqiu Yang, Hong-Gu He, Jiemin Zhu	China	This was a large-scale cross-sectional, descriptive correlation study.	All the nurses who are in charge of dealing directly with COVID-19 but have never experienced mental disorder.	<p>→the use of PPE which causes the lesion on the face of the nurse is one of the factors that increases the mental burden and stress of the nurses</p> <p>→the nurses complained of anxiety, fatigue, fear, and depression on duty during COVID-19 era.</p>	
9.	The experiences of health-care providers	10-15 february 2020	Qian Liu, Dan Luo, Joan E Haase, Qiaohong Guo, Xiao	China	a qualitative study with Semi-structured, telephone	--> In February 2020, nine nurses and four physicians were recruited from five COVID-19-designated	<p>Three theme categories emerged from data analysis:</p> <p>→ being totally</p>	

	<p>during the COVID-19 crisis in China: a qualitative study</p>		<p>Qin Wang, Shuo Liu, Lin Xia, Zhongchun Liu, Jiong Yang, Bing Xiang Yang</p>		<p>interviews in-depth</p>	<p>institutions in Hubei province. →they were in charge of directly dealing with COVID-19 patients.</p>	<p>responsible for the health and well-being of patients → The obstacles of working on COVID-19 wards are numerous. The healthcare workers experience fatigue due to heavy workloads, fear of transmitting and being infected of COVID-19 → The third category was resiliency in the face of adversity</p>	
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Question 1 : The factors Associated workload of Healthcare Workers in COVID-19 era

According to our findings from nine studies that there were some factors associated workload of healthcare workers in COVID-19 era. There were some factors that increasing workload on healthcare workers in COVID-19 era. Using personal protective equipment (PPE) was the first factor (Shoja et al., 2020)(Almaghrabi et al., 2020)(Hu et al., 2020). The healthcare workers must use personal protective equipment (PPE) while on duty, so that they are protected from the transmission of COVID-19 but they felt uncomfortable. Because the rules of using PPE was difficult (Shoja et al., 2020). Beside that using of special personal protective equipment (PPE) caused some of them complain about problems with their face skin (Hu et al., 2020). Secound of factor was lack of knowledge about disaster management, such as how to use PPE correctly, how to managed critical ill patients and increasing knowledge of hospice care self-efficacy, knowledge of healthcare workers self care (Almaghrabi et al., 2020) (Liu et al., 2020) (Zheng et al., 2020). Third, the type of professional group where the nurses have more workload than others professional group (Shoja et al., 2020). Fourth, Increasing the number of COVID-19 patients and the rapidly progress of patients severity (Zhang et al., 2020).

The increasing workload of healthcare workers also affected to their physical and mental health, Because during the COVID-19 era, healthcare personnel were under duress. Such as anxiety, depression, sleep

disorder, burn out, fear, and exhausted factor (Cotrin et al., 2020)(Vanhaecht et al., 2020)(Ramanathan et al., 2020).

Question 2 : The Hospital Strategic to solve the workload of healthcare workers during COVID-19 era

Changing the flow of patient services is one of pursuing a strategy to reduce the workload due to the Covid-19 pandemic by put the screening at the first step of patient arrival to the hospital and the patient must have appointment with the hospital management except patient with emergency condition. The management of hospital devided the area depend on risk of infection. The high risk of infection area was disinfected two times a day with sodium hypochlorite, whereas the non-infection area was disinfected once a day during COVID-19 era (Zhang et al., 2020).

Some studies gave advice for the management of hospital strategic during COVID-19 era. The first was providing disaster management and critical ill course for HCW. The secound was recruitment of HCW by criteria having compotents about COIVID-19 and exhause PPE knowledge. The third was proper insentive with risk of job and workload in pandemic situation.

DISCUSSION

In this systematic review of nine studies, we identified the factors influenced healthcare workers workload during COVID-19 era and the hospital strategic to solve that problem. Because health-care professionals aren't aware of the situation, treatment may be delayed, resulting in infection transmission. As the worldwide danger of COVID-19 grows, it's

more important than ever to enhance health-care professionals' understanding and attitudes. Educational initiatives are desperately needed to reach health-care personnel all around the world, and more research is needed (Bhagavathula AS, Aldhaleei WA, Rahmani J, Mahabadi MA, n.d.). Most of the study were observed situation of health care workers knowledge at the beginning of the covid-19 pandemic. Lack of knowledge about covid-19 because of not yet many things about its aspect were known. Along with the pandemic travel access to get information about various aspects of transmission and management of covid-19 has been very developed and the globalization cause this information is very easy to be accessed by anyone.

The health care workers capacity of critical ill skill contributed on reducing case fatality rate. The average case fatality rate of covid-19 was about 1%. Meanwhile the fact today Covid-19 has caused a rampage around the world. The key areas feeling the brunt of this pandemic have been ICUs in variable healthcare settings, which have experienced a substantial increase in critical care beds and shortages of supplies and health care workers. Causes of deaths in previous pandemics were a result of respiratory failure (<https://www.medscape.org/viewarticle/931961>, n.d.). several health services address the shortage of ICU health care workers by moving health care workers from other non-ICU wards or by recruiting new, younger health workers. This condition makes the Health service have to prepare critical ill training to them.

Long labor hours, exhaustion, occupational burnout, stigma, physical and psychological aggression, and back injuries from patient handling are all frequent among COVID-19 patients' caregivers. It is important that efforts be made to preserve health care professionals' physical and emotional health, as well as the quality of treatment they provide. WHO recommends that IPC measures be supplemented by occupational safety and health measures, psychosocial support, adequate staffing levels, and clinical rotation to reduce the risk of burnout, for safe and healthy working environments, and to respect the rights of health workers to decent working conditions

(<http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-fea8db1a8f51>, n.d.).

The pandemic of COVID-19 has a major impact on the health sector, causing of hospitals as part of health service facilities to experience various problems. Several studies that we identified explained various problems experienced by the hospital, including; limited personal protective equipment for healthcare workers and lack of knowledge about disaster management. These things were factors that affected the workload of healthcare workers. The problems arise indicating the lack of hospital preparation in the face of a natural disaster or a pandemic (World Health Organisation, 2014). The hospital should have formed a risk management team to prepared special plan during pandemic, such as implementation and identification of steps to reduced emergency risk, identified resources as medical equipment supplies,

health personal staff supplies, infrastructure and utilities, make policies, identified deficiencies and weaknesses in hospital emergency preparedness, implement mechanisms to immediately correct these deficiencies such as immediately holding staff training about disaster management (World Health Organisation, 2014) .

In addition, the hospitals as the most important part of managing of pandemic as COVID-19 must prepared standard operating procedures that apply to emergency situation, such as infection prevention and control procedures in hospital, division of infection and non-infection areas, patient triage protocols, the flow of patient traffic in and around the hospital, paying attention to the actions that must be taken to ensure the safety of hospital staff, (especially the healthcare workers), communication and information activities, logistics service and human resource issue (World Health Organisation, 2014).

CONCLUSIONS

Other Information

We identified from several studies regarding others information such as an increase in the workload of cleaning workers in hospitals because they had to disinfect according to protocols. Then there's information on how social media may help people learn about COVID-19.

Limitation

This systematic review has several limitations, the number of studies that we

obtained was very small, only nine studies. So, the information that we wanted to achieve was also not in depth. The type of methodology is cross-sectional, as a result, we're still stumped as to what's causing the rise in healthcare professionals' workload in the COVID-19 era. So, in our opinion, further study is needed related to this theme so that the information obtained is protected from bias.

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