



The Influence Of Personal Protective Equipment (PPE) Based On The Biological And Psychological Aspects Of Nurses In The Covid-19 Pandemic

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Abstract

Introduction: The Covid-19 pandemic is a big challenge in the world of health, including nursing. Nurses are the main stronghold in patient care because nurses meet patients more frequently and longer than other medical personnel. The use of PPE is urgently needed in treating patients with Covid-19, the impact of using PPE cannot be avoided and can affect nurses, feelings of discomfort and poor physical condition can result in a decrease in both physical and psychological health.

Purpose: This article review aims to determine the impact of using PPE on nurses' physical and psychological health during a pandemic.

Method: This article was reviewed by identifying articles in the last 5 years with the theme of the effect of the use of PPE on the physiology and psychology of nurses during a pandemic with the original article inclusion criteria.

Results: This article review collects articles from Google Scholar and Science Direct keywords used PPE, covid19, nurse, physical aspect, and biological aspect. The identification results in 15 articles that met the inclusion and exclusion criteria.

Conclusion: PPE has an impact on the physical aspects, namely respiratory disorders and fatigue. Influences on the psychological aspects are stress, depression, and anxiety. Nurses must have physical and mental health preparations to face various challenges in patient care processes and procedures during the Covid-19 pandemic.

Keywords: PPE, covid19, nurse, physical aspect, biological aspect

Abstrak

Pendahuluan: Masa pandemi covid 19 merupakan tantangan besar di dunia kesehatan termasuk salah satunya adalah keperawatan. Perawat merupakan benteng utama dalam perawatan pasien, karena perawat yang lebih sering dan lebih lama bertemu dengan pasien dibandingkan tenaga medis yang lain. Penggunaan APD sangat dibutuhkan dalam melakukan perawatan pasien dengan covid-19, dampak penggunaan APD tidak bisa dihindari dapat mempengaruhi perawat, perasaan tidak nyaman dan kondisi fisik yang lelak dapat mengakibatkan penurunan kesehatan baik fisik maupun psikologisnya.

Tujuan: Review artikel ini bertujuan untuk mengetahui dampak penggunaan APD terhadap kesehatan fisik dan psikologis perawat pada masa pandemi.



Metode: review artikel ini dilakukan dengan mengidentifikasi artikel 5 tahun terakhir dengan tema pengaruh penggunaan APD pada fisik dan psikologis perawat pada masa pandemi dengan kriteria inklusi original artikel.

Hasil : review artikel ini mengumpulkan artikel dari Google Scholar dan Sciencedirect keyword yang digunakan *PPE, covid19, nurse, physical aspect, biological aspect*. Hasil identifikasi menghasilkan 15 artikel yang sesuai kriteria inklusi.

Kesimpulan: APD memberikan dampak pada aspek fisik yaitu gangguan pernafasan dan kelelahan. Pengaruh terhadap aspek psikologis adalah stres, depresi, dan kecemasan. Perawat harus mempunyai persiapan kesehatan fisik maupun mental untuk menghadapi berbagai tantangan pada proses dan prosedur perawatan pasien di masa pandemi covid-19.

Kata kunci: *PPE, covid19, nurse, physical aspect, biological aspect*

INTRODUCTION

Coronavirus is a disease that attacks the respiratory system. This disease is contagious and is characterized by general symptoms such as fever, cough, weakness, convulsions, and diarrhea. Clinical manifestations in this case usually appear within 2 days to 14 days after exposure (Nurkhalizah, et al.,2021). Nurses and other health workers who serve at the frontline in fighting Covid-19 must implement procedures for using and removing PPE by the SOPs set by the Hospital to reduce the risk of being contaminated with the Covid-19 virus. Personal protective equipment is equipment that must be worn by nurses to protect and protect themselves from the transmission of covid-19 which is transmitted through droplet infection into the body through the eyes, nose, mouth, and throat as well as the skin (Performance, et al., 2021). The incidence of Covid-19 cases, which continues to increase every day, causes health workers to be increasingly depressed due to the increasing workload, worrying about their health, and also their families. Lack of Personal Protective Equipment (PPE) in the workplace is one of the things that cause health workers to experience increased anxiety (Nurkhalizah, et al., 2021). Nurses also feel negative emotions,

challenges, and regulatory changes in various aspects due to COVID-19 and adapt to COVID-19 service standards (Kusumawati, Dwiantoro, and Nurmalia, 2021). Nurses who experience stress have the potential to experience headaches, followed by other symptoms, namely anger, decreased brain function, ineffective coping, and impaired relationships with coworkers, which can reduce nurse performance (Kusumawati, Dwiantoro, and Nurmalia, 2021).

The development of the number of confirmed cases of Covid-19 in Indonesia in the period from January 3, 2020, to October 27, 2020, there were 392,934 confirmed cases of Covid-19 and 13,411 cases of death due to Covid-19. Meanwhile, the number of health workers based on data from PPNI on Tuesday (22/9/2020) recorded that 85 nurses died and 2,979 in several provinces in Indonesia were confirmed to have Covid-19 (Syarifatul Izza, Hanny Handiyani, 2021). According to the WHO risk assessment, it was categorized as Very High on March 28, 2021, which at that time had reported a total of 8,248,185 cases of infection with a total of 445,144 deaths. The countries with the highest number of cases were the United States with 2,207,399 cases, 119,114 people died, a total of 899,254 recovered, Brazil with 928,798 with 45,456 deaths, Russia with 545,458 cases



with 7284 deaths, India with 354,161 cases with 11,921 deaths, England 298,136 cases, and 41,969 people died (Performance et al., 2021). The Journal of the American Medical Association, based on a survey in mental health research, found that most of the 1,275 staff treating COVID-19 in 34 hospitals in China experienced symptoms of depression 50%, anxiety 45%, insomnia 34% and psychological distress 71.5 % (Siti Nurkhalizah, Siti Rochmani, 2021). According to (Kusumawati, Dwiantoro, and Nurmalia, 2021) nurses' work stressors varied, namely excessive workload (82%), unfair wages (58%), and working conditions (52%), not being included in decision making (45%). Stress on individuals has an impact on physical, psychological, social, and spiritual.

Symptoms of stress seen from the biological aspect include headaches, decreased appetite, stomach pain, sweaty palms, palpitations, fatigue or loss of energy, muscle tension, and psychological symptoms such as difficulty concentrating, memory loss, decreased productivity, or work performance. , often feel bored, anxious, restless, frustrated, irritable, and irritable (Kusumawati, Dwiantoro, and Nurmalia, 2021). The importance of using personal protective equipment (PPE) is related to the perception of health workers that has an impact on the occurrence or non-occurrence of an error at work that causes work-related accidents and dangerous infectious diseases (Ismoyowati, 2021). The main reference for Covid-19 patients is a hospital that not only provides good nursing care but also provides safe, quality, and effective services to maintain services that are following established nursing service standards for infection prevention and control. One way is to break the chain of transmission of infection by using Personal Protective Equipment (PPE). This will affect biological

conditions such as feeling hot, uncomfortable when doing activities, and decreasing self-confidence (Zakaria S, 2021)

Based on the biological and psychological problems of nurses that arise as a result of the impact of using PPE during the Covid-19 pandemic, the author is motivated to conduct a literature study from several articles that were obtained and analyzed

METHOD

Data-Based Search

This literature review was identified from Google Scholar and Science Direct. The articles used are articles published in 2020-2021. The keywords used in the identification of the article are PPE, covid19, nurse, physical aspect, and biological aspect. The search results that match the keywords on Google Scholar are 17,939 articles, while the articles that match the literature review there are 13 articles. The search results that match the keywords in Science Direct are 30,594 while the articles that match the literature review there are 2 articles.

Article Selection Management Data

The selection of articles was adjusted to the theme, namely the effect of using PPE on the physical and psychological health of nurses during a pandemic. The article identification method uses the PRISMA diagram.

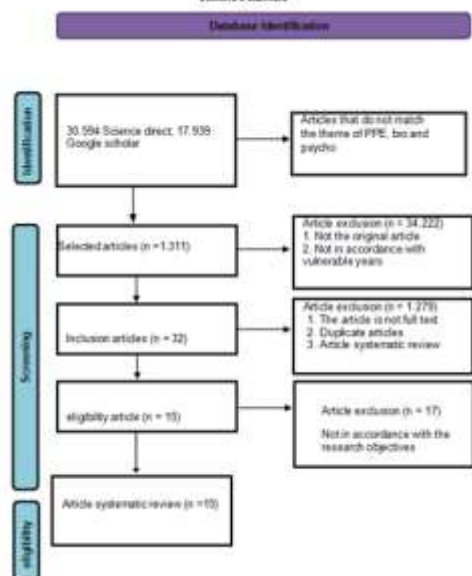
Article Classification

The articles identified in this literature review are using PICOT data analysis (P: Research sample, and in this literature review are health workers with psychological disorders due to the use of PPE during the Covid-19 pandemic, I: No intervention was given to samples in all the

articles reviewed, C: There is no comparison of interventions in this literature review, O: The results of research in the literature review show that there is a biological and psychological influence of health workers, especially nurses on the use of Personal Protective Equipment, Q: The research time in this literature review takes the least amount of time 1 month and maximum 6 months). Identification of articles is done by selecting the original articles of the last 5 years and issuing articles using the review and book chapter methods.

often directly has a greater risk of disease transmission or nosocomial infections. Personal Protective Equipment (PPE) is a set of safety equipment to protect all or part of the body from occupational diseases. So that health workers who carry out examinations of Covid-19 patients are required to use complete personal protective equipment, in order to avoid the transmission of Covid-19. The use of PPE by nurses during a pandemic must meet the comfort requirements, according to the results of the article review showing that nurses who get PPE do not have a good effect on the psychology of nurses such as depression, anxiety, mild to severe stress, and fatigue. The physical impact of using PPE is a disruption to breathing and vision.

Table 1. PRISMA



PRISMA diagram The Effect of Using Personal Protective Equipment for Nurses in Hospitals During the Covid-19 Pandemic on Biological and Psychological Aspects: A Literature Review.

RESULT

Personal protective equipment (PPE) is something that must be worn during the COVID-19 pandemic, a nurse as a health worker who interacts with patients more

DISCUSSION

Impact of Availability of PPE on Nurses' psychological health

The need for PPE for nurses affects the performance of nurses, meeting the needs of PPE has an impact not only on the nurse's physique but also psychologically, one of which is feelings of anxiety when carrying out care. The psychological readiness of nurses is one of the main priorities after the physical health of nurses. Psychological health affects how the process of nursing services, especially during the Covid-19 pandemic, healthy psychology makes nurses more confident in caring for patients (Babakal, Manampiring, and Wariki, 2021). PPE has 3 benefits, namely for preventive measures through air, droplets, and general contact (Sinaga et al., 2019). With the lack of availability of complete PPE according to the WHO protocol, health workers are more likely to have anxiety and fear disorders compared to personal protective equipment as needed (Simak and Kristamuliana, 2020). Lack of adequate PPE is a risk factor and is a significant factor associated with depression. Every

action taken by nurses to patients with Covid-19 requires the availability of PPE, this increases the confidence of nurses and reduces anxiety. There is a significant relationship between the adequacy of PPE and the anxiety of health workers in health care settings, one of which is proper and appropriate PPE (Ismoyowati, 2021).

The mental health impact of nurses when using PPE

Health workers who have more direct contact with Covid-19 patients have a higher level of anxiety. Previous research stated that there was a significant difference between the number of contacts with Covid-19 patients and the adequacy of PPE. The identification results show that there are reports that the availability of PPE does not match the frequency of contact with Covid-19 patients so many nurses feel very anxious after direct contact with depression (Arnetz et al., 2020). Insufficient PPE availability and direct contact with Covid-19 patients are closely related to depression. Nurses show feelings of anxiety and hopelessness which are two things that affect the level of depression in the work environment. Nurses feel more confident and safe when wearing appropriate PPE (Bumpstead et al., 2021). The low level of compatibility of PPE is related to psychological discomfort when using PPE, some nurses feel that it does not match the shape, size, and design of PPE (Janson, Clift, and Dhokia, 2021).

Barriers associated with wearing PPE related to biological conditions

PPE causes heat or increased body temperature, symptoms such as shortness of breath and dizziness, and discomfort, affecting their movement thereby reducing their work efficiency. Immediately after putting on PPE, nurses feel very hot (Davey et al., 2021). Headaches, shortness of breath, and sweating were felt by the nurses in approximately 10 minutes, 2

hours later all that was felt was soaking wetness on the clothes and a feeling of numbness on the fingers because of wearing 3 layers of gloves. Another obstacle that was felt was that at the time of infusion, the nurse could not feel the vein because of the thickness of the gloves and could not see the vein clearly because she was using Google glasses. Prolonged use of PPE with this impact makes nurses physically tired with dull faces, damaged skin, and blisters (Cui et al., 2020)



Tabel 1. The Effect of Using Personal Protective Equipment for Nurses in Hospitals During the Covid-19 Pandemic on Biological and Psychological Aspects: A Literature Review

STUDY	STUDY DESIGN	PARTICIPANTS	INTERVENTION	COMPARE	OUTCOMES	TIME
Arnetz <i>et al.</i> , 2020	A cross-sectional online survey	n=695 respondent	-	-	Nurses do not get proper PPE, causing depression, anxiety, and stress.	1 Month
Bumps <i>et al.</i> , 2021	Multi-method survey	n= 82 respondent	-	-	PPE training can improve skills such as ease of practice, ease of remembering procedures for wearing and removing PPE, being more confident, and helping to understand PPE applications and procedures.	6 Month
Davey <i>et al.</i> , 2021	An online anonymous questionnaire-based survey	n=230 respondent	-	-	PPE complicates the work of nurses and harms breathing and vision.	4 Month
(Janson , Clift and Dhokia , 2021)	Pilot study & survey development, Structure of survey, Distribution, and Analysis	n=248 respondent	-	-	<p>1. Suitability of PPE by item.</p> <p>a. Gloves Women are more comfortable wearing gloves than men.</p> <p>b. Aprons (celemek) wanita lebih nyaman menggunakan celemek dari pada laki-laki akan tetapi perbedaannya masing sangat kecil</p> <p>b. Surgical Gowns men are more comfortable wearing gowns than women.</p> <p>c. Surgical Masks Men are more comfortable wearing gowns than women</p> <p>d. FFP (Filtering Face Piece) users experience bruises and scratches after using both men and women.</p> <p>e. Respirators Visor/Face Shield Men are more comfortable using face shields than women</p> <p>f. Goggles/Glasses Male and female users feel comfortable wearing goggles, but in certain circumstances, women are more comfortable.</p>	-

STUDY	STUDY DESIGN	PARTICIPANTS	INTERVENTION	COMPARE	OUTCOMES	TIME
					g. Surgical Scrubs Both men and women feel comfortable using surgical scrubs. 2. A small percentage stated that they felt safe at all times or that their PPE as appropriate. 3. Modify or buy PPE To improve comfort and health, health workers modify PPE. Both men and women are the same	
Ali salaka & iqra, 2021	<i>Cross-sectional quantitative analysis</i>	n=20 respondent	-	-	Impact of using PPE 1. Most are inhibited from doing work. 2. Safety performance feedback mostly states safety 3. Most of them are required to wash their hands	1 Month
Ismoyowati, 2021	Quantitative descriptive	n=70 respondent	-	-	Impact of using PPE 1. The majority have mild anxiety 2. The majority have a comfortable level	1 Month
Siti Nurkhaliza, <i>et al</i> , 2020	Descriptive cross-sectional analytic	n=100 respondent	-	-	1. There is a significant relationship between the Anxiety Level of the Use of Personal Protective Equipment (PPE) and the Prevention of Covid-19 Transmission in Nurses Terdapat hubungan yang bermakna antara APD dengan pencegahan penularan covid-19 2. Most experience severe anxiety	1 Month
Simak Fridoli n Valenand kristam ulia, 2020	Descriptive cross-sectional analytic	n=146 respondent	-	-	Good self-efficacy in handling Covid-19 is influenced by good nurse knowledge about PPE.	2020
Cui <i>etal.</i> , 2020	Qualitative content analysis	n=12 respondent	-	-	The better the knowledge of nurses in using PPE, the higher the confidence of nurses	2020
Babakal <i>et al.</i> , 2021	Analytical observation	n= 293 respondent	-	-	The use of PPE and nurse compliance do not influence each other.	May 2021
Goyena	Analytical descriptive	-	-	-	There is a significant influence between the	2021

STUDY	STUDY DESIGN	PARTICIPANTS	INTERVENTION	COMPARE	OUTCOMES	TIME
, 2021					limitations of PPE and the mental readiness of nurses	
Rosyanti et al., 2020)	Quantitative descriptive	-	-	-	Inability to maintain physical and mentally healthy, nurses have a risk of experiencing psychological disorders and fatigue.	15 March2021
(Asriyani and sriningsing, 2021)	Quantitative descriptive-analytic	100 respondent	-	-	The level of anxiety affects the use of PPE. The high level of anxiety causes a reduction in efforts to prevent the transmission of Covid-19.	June 2021
Zaki etal., 2018	Analysis	100 respondent	-	-	There is an effect of the availability of PPE and supervision on the use of PPE in nurses. Adequacy of the number of PPE as a means of preventing the transmission of Covid-19 is a major factor.	October 2018
Yuan etal., 2020	Descriptive analysis	-	-	-	The use and improvement of PPE protocols can help health workers to protect themselves when caring for COVID-19 patients, especially by reducing the risk of infection when officers remove PPE.	2020



CONCLUSION

Personal protective equipment is equipment that must be worn by nurses to protect and protect themselves from the transmission of covid-19 which is transmitted through droplet infection into the body through the eyes, nose, mouth, and throat as well as the skin. Lack of Personal Protective Equipment (PPE) in the workplace is one of the things that cause health workers to experience increased anxiety. Nurses who experience psychological disorders such as stress have the potential to experience biological disorders such as headaches, followed by other symptoms, namely anger, decreased brain function, ineffective coping, and impaired relationships with co-workers which can reduce nurse performance. Facing the covid-19 pandemic, nurses must prepare physically and mentally strong, physical health can increase the body's immunity to minimize the transmission of covid-19. Mental health affects the readiness of nurses to care for Covid-19 patients starting from preparation for the process and termination of the disease. Well-prepared physical and mental health will have a positive impact on nurses, namely reducing risks that occur in biological and psychological aspects.

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