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Compliance of Nurses in the Use of Personal Protective Equipment (PPE) During the COVID-19 Pandemic in a Private Hospital in Western Indonesia

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Abstract

Background: Corona Virus Disease (COVID-19) is a respiratory disease caused by SARS-CoV-2, which spreads through droplets, aerosols, and contact with the eyes, nose, or mouth with hands contaminated by the virus. One preventive measure is the use of personal protective equipment (PPE). Nurse compliance in using PPE can have positive impacts on nurses. The research objective is to assess the overview of nurse compliance in the use of PPE during the COVID-19 pandemic.

Objectives: This research aims to determine nurse compliance with the use of Personal Protective Equipment (PPE) during the COVID-19 pandemic.

Methods: The research method employs a quantitative approach with an analytical descriptive research design. A Purposive sampling technique was used to select 49 nurses as the research sample. The instrument used was a questionnaire, and univariate data analysis was conducted. The study was conducted from March 30 to April 13, 2022.

Results: The findings of this research indicate that the level of nurse compliance in using PPE during the COVID-19 pandemic falls into the compliant category, with all 49 nurses (100%) exhibiting compliance.

Conclusion: Nurses demonstrate compliance in using PPE during the COVID-19 pandemic.

Keyword: COVID-19, nurse compliance, PPE

Introduction

Coronavirus Disease – 2019 (COVID-19) is a contagious disease caused by one type of coronavirus, namely Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-COV2). First discovered in humans with an unknown etiologic in the city of Wuhan, China, on December 31, 2019, it was declared a Public Health Emergency of International Concern (PHEIC) by WHO on January 30, 2020. On March 11, 2020, WHO declared it a pandemic.[1]

According to the World Health Organization (WHO), the global number of confirmed COVID-19 cases is 505,817,953, and as of April 24, 2022, there are 6,044,150 cases in Indonesia.[2] The confirmed positive cases of COVID-19 in Banten Province are 291,953, with 26,854 cases in Tangerang Regency and 12,238 cases in Kelapa Dua District.[3] Based on data from one Private Hospital in Western Indonesia, it was found that 5,039 people were confirmed positive for COVID-19 from January 2020 to December 2021.

Contact with individuals infected with the COVID-19 virus through exposure to coughing, sneezing, droplets, and aerosols can lead to infection transmission, where the COVID-19 virus enters the human body through the mouth and nose.[4] Nurses, as frontline workers in handling this viral infection, are tasked with monitoring, and caring for COVID-19 patients, requiring the use of PPE by applicable standards to reduce the risk of COVID-19 exposure. As of April 24, 2022, 2,087 healthcare workers in Indonesia have succumbed to COVID-19, with 670 nurses among them, and 49 healthcare workers in the Banten region.[5] Based on data from one Private Hospital in Western Indonesia, 54 nurses were confirmed positive for COVID-19.

Personal Protective Equipment (PPE) is equipment that can protect healthcare workers from contact with patients in the room. PPE includes gloves, surgical masks or N95 masks, gowns, aprons, goggles, face shields, hair caps, and shoe covers.[6] One private hospital in Western Indonesia implements the use of PPE, especially during the COVID-19 pandemic. According to the researcher's interview with the hospital's HDON, several changes in the regulations for the use of PPE have occurred for nurses working in the red zone service areas, namely ED external, COVID-19 care areas (IPD, ICU, HCU, OT, HD, LDS), mortuary covid-19, and covid-19 specimen collection areas. Based on the SHG protocol revision 21, the current PPE used in the red zone includes a single N95 Mask/KN95, face shield/goggles, single gloves (during patient contact), surgical gown with head cover/coverall gown (hazmat) without head cover, apron (for actions at risk of exposure to patient body fluids), and boot/shoe covers. These changes in regulations are related to the fluctuation of confirmed positive COVID-19 cases in Indonesia. To prevent nurses from being infected with the virus, nurses need to comply with the use of PPE based on their designated zones, such as using level 1 PPE in the green zone, level 2 PPE in the yellow zone, and level 3 PPE in the red zone.[7]

Compliance is behavior that indicates a change in attitude in line with established goals, where compliant nurses exhibit behavior that must be done or adhered to, whether based on an action, procedure, or regulation.[8] Age, gender, education level, and length of service can influence an individual's compliance.[9] This is consistent with the research conducted by Anugrahwati & Hakim (2019), stating that education, age, length of service, and gender are factors influencing nurse compliance in using PPE.[10]

The results of researcher observation in the red zone of PPE usage at a hospital in Western Indonesia, it was found that some nurses did not use complete PPE according to their designated zones. The researcher did not obtain data on nurse characteristics or compliance in using PPE based on the observed data, due to limitations in researcher access to enter and exit rooms. The objective of this study is to identify the description of nurses' compliance with the use of personal protective equipment (PPE) during the COVID-19 pandemic in one private hospital in western Indonesia.

Methods

This study employs a quantitative research method with an analytical descriptive research design. The population in this study consists of 95 nurses in the COVID-19 red zone at a private hospital in Western Indonesia. The research uses purposive sampling with a sample size of 49 nurses. The inclusion criteria for this study are nurses willing to be respondents, nurses working in the COVID-19 red zone, nurses aged 21-50 years, and the exclusion criteria are nurses on leave.

The instrument in this study uses a modified research questionnaire from Deviyanti (2021)[11] which has obtained permission from the previous researcher for use in this study. The research questionnaire underwent validity and reliability tests using Content Validity Index (CVI) and Inter-Rater Reliability (IRR) tests conducted by 4 nursing lecturers as experts. The assessment was based on four qualifications, and the validity test results were Relevance (0.98), Clarity (0.96), Simplicity (0.98), and Ambiguity (0.94), concluding that the research questionnaire is valid. For the reliability test, the values obtained were Relevance (93%), Clarity (84%), Simplicity (89%), and Ambiguity (76%), concluding that the research questionnaire is reliable. There are 23 questions with scores ranging from 1 (lowest) to 5 (highest) for each question. The response choices include always, often, sometimes, rarely, and never.

The researcher conducted the study by distributing the questionnaire online, assisted by the Head Division of Nurses (HDON) at the research hospital, and obtained respondent approval through informed consent. After data collection, the researcher did the univariate analysis with editing, coding, data entry, cleaning, tabulating, and data analysis stages. The data analysis used in this study is univariate data analysis which aims to see the frequency distribution of respondent characteristics and nurse compliance in the use of PPE.

Results

Here are the research findings regarding the Overview of Nurse Compliance in the Use of Personal Protective Equipment (PPE) During the COVID-19 pandemic at a private hospital in Western Indonesia.

Respondent Characteristics

Table 1. Characteristics of Respondents Based on Age, Gender, Education Level, and Length of Service of Nurses in the COVID-19 Red Zone at a Private Hospital in Western Indonesia (n=49)

Respondent Characteristics	Frequency (n)	Percentage (%)
Age		
21-30 years	44	89,8
31-40 years	4	8,2
41-50 years	1	2
Gender		
Male	12	24,5
Female	37	75,5
Education Level		
Diploma III	8	16,3
Diploma IV/Bachelor's Degree	5	10,2
Nursing Profession	36	73,5
Length of Service		
New (< 6 years)	41	83,7
Intermediate (6-10 tahun)	5	10,2
Long (> 10 years)	3	6,1

Based on Table 1, the results of respondent characteristics based on age show that the majority belong to the 21-30 age group, with a total of 44 respondents (89.8%). The majority of respondents based on gender are females, totaling 37 respondents (75.5%). The highest education level among respondents is Nursing Profession, with 36 respondents (73.5%). The majority of respondents based on length of service is less than 6 years, with a total of 41 respondents (83.7%).

Nurse Compliance
Table 2. Nurse Compliance in the Use of Personal Protective Equipment (PPE) During the COVID-19 Pandemic in the Red Zone at a Private Hospital in Western Indonesia

Compliance	Frequency (n)	Percentage (%)
Compliant	49	100
Non-compliant	0	0
Total	**49**	**100**

Based on Table 2, the results show that the compliance of nurses in the COVID-19 red zone in using Personal Protective Equipment (PPE) is entirely compliant, with a total of 49 nurses (100%).

Discussion
Respondent Characteristics
Based on the research results, it was found that the majority of respondents fell within the age range of 21-30 years, with a total of 44 respondents (89.8%). This is in line with the study conducted by Suryani et al. (2022), where the majority of respondents were in the 21-30 age range, comprising 36 respondents (50%). The study interprets age as an individual's age calculated from birth, representing the increasing maturity of an individual's mental and working abilities with age. The age range of 21-50 years is considered a productive working age for individuals, allowing for stability in work and the ability to determine responsibilities, including compliance responsibilities.[12]

According to the researcher's findings, most respondents were female, totaling 37 respondents (75.5%). This aligns with the study conducted by Aditia et al. (2021), which had a higher number of female respondents than male respondents, specifically 135 respondents (78.5%). Female nurses tend to exhibit higher precision than male nurses. Women are more likely to prioritize feelings such as anxiety, compassion, gentleness, and concern for the surrounding environment, leading to a more cautious approach to nursing actions.[13] This is supported by the research of Izah et al. (2020), stating that the nursing profession is closely related to the issue of a woman's motherly instinct, encompassing precision, patience, and care needed in providing nursing care. However, it does not rule out the possibility that men also exhibit precision and compliance in nursing actions.[14]

Based on the research results, the highest education level among respondents was S1 Ners, with a total of 36 respondents (73.5%). This corresponds to the study conducted by Wahyuningsih & Susanti (2021), where 37 nurses (82.22%) had an S1 Ners education level. A higher education level indirectly influences an individual's actions and behavior.[15] According to Supriyatna (2020), education is essential for someone to develop performance within an organization and achieve established goals and capabilities. The knowledge gained by nurses can stimulate critical and creative thinking in decision-making, including compliance with the proper use of PPE.[16]

Based on the researcher's findings, the majority of respondents had a length of service of less than 6 years, categorized as new, with a total of 41 respondents (83.7%). This is consistent with the study conducted by Aditia et al. (2021)[13], where 64 nurses (74.4%) with less than 5 years of experience were the most compliant in using PPE. Extensive work experience affects a nurse's skills in various tasks and enables them to adapt to their job and work environment, including complying with the use of complete and standard-compliant PPE.

Nurse Compliance
The results of this study revealed that all respondents (100%) fall into the compliant category. This is consistent with the study conducted by Suryani et al. (2022)[18], where out of 72 nurses surveyed, 61 nurses (84.70%) exhibited a positive attitude towards PPE usage.

According to the Ministry of Health of the Republic of Indonesia (2021)[19], the COVID-19 red zone is an area with high transmission, categorized as a high-risk area, necessitating compliance with PPE usage. The researcher identified factors influencing nurse compliance in PPE usage, including the availability of PPE in the hospital, nurses' awareness of the importance of PPE usage, hospital-led awareness campaigns, and the reduction of nurse exposure to COVID-19 incidents.[16]

Following the study conducted by Deviyanti (2021)[11], an individual is considered compliant in using PPE based on several aspects, ranging from PPE donning to doffing. Compliance with the proper and complete use of PPE for infection control measures is crucial, and adhering to established procedures to prevent the spread of the COVID-19 virus, has implications for the safety of nurses.[6]

Factors such as age, gender, education level, and length of service can influence nurse compliance with PPE usage. In the researcher's study, the result showed that all 49 nurses (100%) were compliant. This could be attributed to the anxiety experienced by nurses working during the COVID-19 pandemic, fostering greater adherence to protect themselves, patients, and the surrounding environment from the spread of the COVID-19 virus. Therefore, the characteristics of the respondents in this study may not accurately depict compliance since all samples were compliant and tended to be compliant due to anxiety during the COVID-19 pandemic. This analysis is supported by the research conducted by Roberto Muliantino et al. (2021)[20], stating that the COVID-19 pandemic has a psychological impact on nurses working amidst heavy stressors, where the majority of nurses experience anxiety, stress, and depression within normal ranges. The main stressor involves the risk of virus exposure to family and other social environments. Hence, one strategic step in preventing the spread of the COVID-19 virus among nurses is compliance with PPE usage. The research process also faced limitations, including the inability to conduct direct observations due to the hospital being a COVID-19 referral hospital and changes in PPE usage regulations due to fluctuations in COVID-19 cases.

Future researchers could conduct further studies on factors influencing nurse compliance with PPE during the COVID-19 pandemic and explore the relationship between respondent characteristics and nurse compliance with PPE usage during the COVID-19 pandemic. Additionally, it is hoped that future researchers can directly observe nurse compliance in using complete and proper PPE as per established standards.

Conclusion

The respondents in this study were nurses who were in the age category of 21-30 years, female gender, S1 education level, with <6 years of service. All nurses on duty in the COVID-19 red zone are compliant with the use of personal protective equipment (PPE).

Conflict of Interest Declaration

No potential conflict of interest relevant to this article was reported.

Acknowledge

Not mentioned.

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