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Compliance with using Personal Protective Equipment (PPE) and the incident of COVID 19 in health workers

Cucu Herawati *, Gina Latifah, Iin Kristanti, Supriatin, Suzana Indragiri, Nuniek Tri Wahyuni, Awis Hamid Dani and Laili Nurjannah

Department of Public Health, Sekolah Tinggi Ilmu Kesehatan Cirebon, West Java, Indonesia.

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Abstract

The number of confirmed cases and deaths due to COVID-19 among health workers is increasing. Health workers have a high risk of being exposed to Covid-19 infection, so compliance with the use of PPE must be considered. The purpose of this study was to analyze the effect of the level of compliance using PPE on the incidence of Covid 19 in health workers. This type of analytic research with a cross-sectional design, the population is 43 health workers, and the sampling technique uses saturated sampling. Methods of collecting data through interviews, observation, and documentation, data analysis using the chi-square test. The results showed that respondents who did not comply with using PPE were mostly confirmed positive for Covid 19 as many as 14 (73.7%) and respondents who complied using PPE were mostly not confirmed positive for Covid 19 as many as 15 (62.5%). There is an effect of the level of compliance using PPE on the incidence of Covid 19 in health workers (P value, 0.040). There should be SOPs for using PPE, policies, and sanctions for the use of PPE, simulation or training in the application of PPE, availability of PPE in good and complete condition, and continuous supervision of compliance with using PPE.

Keywords: PPE; Incidence; Covid 19; Health workers

1. Introduction

Covid-19 is a disease caused by a new type of coronavirus, namely Sars-CoV-2, which can be transmitted from human to human through close contact and droplets [1]. On July 20, 2021, there were 190,743,225 cases of Covid-19 in the world and 4,099,018 deaths, with a Case Fatality Rate (CFR) of 2.2% [2]. On August 9, 2021, stated that there were 203,601,641 cases of Covid-19 in the world and 4,310,970 deaths [3].

The number of cases in Indonesia on July 20, 2021, there were 2,950,058 cases and 76,200 deaths (CFR: 2.6%) [2]. On July 30, 2021, the cases continued to increase, with 3,372,374 infected with 92,311 deaths and on August 09 2021, positive confirmed cases reached 3,686,740 with 108,571 deaths [3]. West Java Province confirmed the number of Covid-19 on May 31, 2021, with as many as 313,949 cases with 4,204 deaths, on July 30, 2021, the cases reached 381,458 with 5,360 deaths, and on August 8, 2021, 636,983 infected cases and 10,383 deaths. Positively confirmed cases and deaths in West Java Province continue to increase [4].

Based on the Cirebon Regency Covid-19 Information Center, positive cases of Covid-19 have continued to increase, where on July 24, 2021, there were 227 confirmed positive cases, on July 25, 2021, it increased to 329, and on August 9, 2021, it increased drastically by 1217 cases [5]. Based on the report from the Suranenggala Health Center, Cirebon Regency, there were 406 cases confirmed positive until August, and 27 cases died. 33 health workers have been exposed to COVID-19.

* Corresponding author: Cucu Herawati

Department of Public Health Sekolah Tinggi Ilmu Kesehatan Cirebon, West Java, Indonesia.

Health workers are at high risk of being infected with Covid-19 because they are on the front line in handling confirmed cases (Ministry of Health RI, 2020). One of the causes of the increase in deaths due to Covid-19 in health workers is due to incomplete and obedient use of PPE. PPE is used by health workers to protect themselves from exposure to infectious diseases [6].

Direct exposure, lack of PPE availability, lack of training, supervision, and lack of compliance with PPE use, can cause health workers to be infected with Covid-19 [7]. Health workers who are confirmed positive for Covid-19 are quite high, there are more than 3000 [8]. On 7 May 2020, 989 health workers died from Covid-19 worldwide [9]. On July 21, 2021, as many as 1,459 workers health in Indonesia died from the virusCovid-19 [10]. Based on data in West Java, in June 2021 there were more than 100 doctors who were confirmed positive. The number of cases in Cirebon Regency has been reported to have 150 health workers exposed to Covid-19 [11].

Standard use of PPE for health workers, depending on the situation and condition of patient handling [12]. How the use of PPE correctly greatly affects the rate of transmission of Covid-19 [13]. Health workers to prevent infection with COVID-19 through administrative, environmental, and appropriate use of Personal Protective Equipment (PPE) [14]. The need for PPE in health care facilities is very dependent on the types of PPE available [15]. The results of research by Reny Marlina et al (2020), as many as 92.6% of officers comply with the use of PPE [16]. Dhini Anggraini Dhillon's research (2020), there are 60% of respondents have obedient behavior towards the use of PPE. The availability of PPE facilities at the Suranenggala Health Center, Cirebon City is inadequate (masks, gloves, gowns) in terms of quantity and quality. The purpose of this study was to analyze the level of compliance with the use of PPE with the incidence of Covid 19 in health workers.

2. Research Methods

This research is analytical research, with a cross-sectional design [17]. The independent variable in this study was the level of compliance with using PPE (masks, gloves, gowns) and the dependent variable was the incidence of Covid 19. The population in this study was 43 health workers. The sampling technique is total sampling [18]. Methods of collecting data through interviews, observation, and documentation. Data analysis used the chi-square test [19].

3. Results

Table 1 Description of Respondents Based on Age, Gender, Compliance Level, and Covid-19 Incidence

| Mean | Minimum | Maximum | Standard Deviation |
|-------------------|---------|-----------|--------------------|
| 34.93 | 25 | 53 | 7.453 |
| Gender | | Frequency | Percentage |
| Man | | 14 | 32.6 |
| Woman | | 29 | 67.4 |
| Total | | 43 | 100.0 |
| Compliance level | | | |
| Not obey | | 19 | 44.2 |
| Obey | | 24 | 55.8 |
| Total | | 43 | 100.0 |
| Covid 19 incident | | | |
| Yes | | 23 | 53.5 |
| Not | | 20 | 46.5 |
| Total | | 43 | 100.0 |

Based on table 1. obtained the minimum age of health workers is 25 years and a maximum of 53 years with an average age of 34.93 years. There were 29 (67.4%) health workers and 14 (32.6%) male health workers. Respondents who had

non-compliance were 19 health workers (44.2%) and the level of compliance was 24 health workers (55.8%). Respondents who have confirmed Covid 19 are 23 (53.5%).

Table 2 The relationship between the level of compliance with the incidence of Covid 19

| Level | Covid 19 incident | | | | Total | | P Value |
|----------|-------------------|------|-----|------|-------|-----|---------|
| | Yes | | Not | | n | % | |
| | N | % | n | % | | | |
| Not obey | 14 | 73.7 | 5 | 26.3 | 19 | 100 | |
| Obey | 9 | 37.5 | 15 | 62.5 | 24 | 100 | 0.040 |
| Total | 23 | 53.5 | 20 | 46.5 | 43 | 100 | |

Based on table 2. shows that respondents who do not comply with using PPE are mostly confirmed positive for Covid 19 as many as 14 (73.7%) and respondents who comply with using PPE are mostly never confirmed positive for Covid 19 as many as 15 (62.5%). Obtained a p-value (0.040), which indicates that there is a significant relationship between the level of compliance with the incidence of Covid 19.

4. Discussion

The results of the study found that there was a relationship between adherence to using PPE with the incidence of Covid 19 in health workers with a p-value (0.040), in line with the results of previous studies which stated that there was a relationship between compliance with using PPE with implementation efforts to prevent Covid-19 disease and there was a relationship between knowledge of IPSRS officers with compliance with using PPE [15].

Based on the results of this study, 44.2% did not comply with using PPE. Health workers do not comply with using PPE by 54.7% [15], according to research by Dhini Anggraini dhilon (2021) it was found that midwives used PPE who did not comply with 40.0% [20] and according to Indra Agussamad's research (2019), that nurses who had sufficient knowledge were mostly non-compliant in using personal protective equipment. as many as (59.1%) [21]. According to research by Rehab H. (2021), Health workers who do not comply with using PPE 53.2% [22]. Compliance with the use of PPE is low among health workers. A clear policy on the use of PPE and availability of PPE is needed to avoid the spread of infection [23].

Health workers who do not comply with using PPE, are caused by several factors including the awareness that is still lacking, there is perception that using PPE does not have to be complete and the use of PPE reduces the sense of comfort at work. Health workers who do not have sufficient PPE availability at their health centers will not use PPE completely [24]. The increased risk of COVID-19 for health workers is strongly influenced by the availability of personal protective equipment, workplace settings, professions, and contact exposure [25].

Health workers must always be vigilant in preventing exposure to disease, without effective administrative and mechanical controls, the benefits of using PPE will not be maximized. Using PPE is one of the efforts to prevent harm to health workers [26]. The use of PPE is a must, but there are still many health workers who do not comply, this is due to a lack of discipline [27]. Disobedience to using PPE at work is one of the unsafe actions taken by workers. According to the Domino Theory, unsafe actions from humans can harm workers and others [28]. The low behavior of compliance with the use of PPE can result in the safety and health of health workers [29]. Health workers are at the forefront of the fight against COVID-19, thus they are at high risk of contracting the infection, due to direct, close, and prolonged contact with patients. More than 80% of health workers believe in the effectiveness of PPE in protecting them from contracting COVID-19 infection [30].

The results of the study found that 90.6% of health workers were obedient in using Personal Protective Equipment, in the context of infection prevention and control efforts at work [31]. There are 49.4% of health workers wear masks consistently and only 54.9% use personal protective equipment (PPE) consistently at work and during contact with patients. This study shows that the majority of health workers have sufficient knowledge about COVID-19, while the majority do not adhere to the consistent use of PPE [7]. There are still respondents who do not comply with the use of PPE (44.2%), according to the researcher, this is an important problem that must be addressed immediately because it has the potential to pose a danger to health workers and the surrounding environment, as a means of transmitting infectious disease. Several interventions that must be carried out in overcoming the problem of non-compliance using

PPE include the existence of SOPs in using PPE, there are policies and sanctions for the use of PPE, and simulation or training in the application of PPE [32]. The availability of complete PPE, as well as continuous supervision, can improve compliance with using PPE [33].

5. Conclusion

The rate of non-compliance using PPE was 44.2% and the incidence of Covid 19 among health workers who had been confirmed positive for Covid 19 was (53.5%). There is a significant relationship between the level of compliance with using PPE with the incidence of Covid 19 in health workers. It is necessary to increase socialization, the availability of PPE in good and complete condition, continuous supervision, and health workers to increase compliance in the use of PPE.

Compliance with ethical standards

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Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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