

# Analysis of factors affecting compliance of health workers using personal protective equipment

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## ABSTRACT

Compliance with the use of PPE in the workplace is an effort to minimize the risks that occur and as a form of guarantee of work safety and security when carrying out medical procedures. There are several factors that influence the adherence of health workers to using Personal Protective Equipment (PPE). The purpose of this study was to determine the factors that influenced the adherence of health workers to using Personal Protective Equipment (PPE) during the Covid-19 pandemic at the Waena Health Center. This type of research is quantitative with cross sectional design. The number of research samples was 51 respondents who were taken by simple random sampling technique. Data collection used questionnaires and observation sheets with the Fisher's Exact Test statistic. The Fisher Exact Test statistical test research showed that there was an effect of knowledge ( $p=0.027 < 0.05$ ), years of service ( $p=0.042 < 0.05$ ), and attitude ( $p=0.006 < 0.05$ ) and which had no effect on compliance of health workers using Personal Protective Equipment (PPE), namely the availability of PPE ( $p=1.000 > 0.05$ ). Health workers should always be aware of the importance of using PPE to maintain personal safety when providing health services.

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## INTRODUCTION

Occupational health and safety is the promotion and maintenance of the highest levels of physical, mental and social welfare, where there is prevention of the risk of experiencing work accidents, protection of workers from risks that can harm health, placing and maintaining workers in a work environment adapted to physiological and psychological equipment that does not endanger lives (Waleleng & Manampiring, 2020). The aim of the K3 program is to obtain a degree of health both physical, mental and social, with preventive and curative efforts, against work-related illnesses and accidents that can be caused by work, work tools, materials, processes and work environment (Sugiono, N., Ali, J., & Miranda, 2020). Implementation of the Occupational Health and Safety (K3) program is one form of effort to create a safe and healthy workplace so as to reduce the risk of work accidents and work-related diseases. Nurse compliance in using Personal Protective

Equipment (PPE) is behavior as a professional towards a recommendation, procedure or regulation that must be carried out and obeyed according to established procedures (protap). The low adherence to the use of PPE by nurses can result in the safety and health of nurses because they do not pay attention to the established standard procedures (Protap) (Subagyo, 2020).

The epidemic that is currently sweeping the world is Covid-19 where some experts say that Covid-19 is an infectious disease caused by a new type of coronavirus with common symptoms of fever, weakness, coughing, convulsions and diarrhea (Repici et al., 2020). In December 2019, a number of patients with mysterious pneumonia were reported for the first time in Wuhan, China (Phelan, Katz & Gostin, 2020). This virus has been named severe acute respiratory syndrome Coronavir 2 (SARS-CoV-2) and can move quickly from human to human through direct contact (Li, Yang, & Ren, 2020).

According to the World Health Organization (WHO) on April 6 2020, the number of sufferers in the world is 1,278,523 who are infected with Covid19 cases. Of the 1.2 million positive cases of corona, 69,757 (5.46%) Covid-19 patients have died and 266,732 (20.9%) people have recovered from the total positive cases. Meanwhile, in Indonesia, the latest data on the number of positive cases of the Corona Virus (Covid-19) still shows an increase of 2,491 cases. The death rate for Covid-19 patients has also continued to increase by 209 people (8.39%) and 192 people (7,705) recovered and the number of positive sufferers. From this data comparison, Indonesia is still experiencing an increase in the number of deaths and patient recovery rates (Ansori, 2020).

Whereas in the Covid-19 data available in Papua Province, in the last update on November 25 2020 it was stated that out of a total of 45 hospitals 16 of them were Covid-19 referral hospitals. As many as 11,481 people were confirmed exposed to Covid-19, 2,510 people (22%) were treated, 8,775 people (76%) recovered and 196 people died (2%). Specifically in Jayapura Regency, based on the latest Covid-19 daily chart data, 5,474 people were positive for Covid-19, 1,415 people were treated, 3,467 people recovered and 92 people died (Baihaqi & Rumaropen, 2022).

Under these conditions, it is very important to pay attention to Personal Protective Equipment (PPE), especially compliance with its use. Compliance with the use of PPE in the workplace is an effort to minimize the risks that occur and as a form of guarantee of work safety and security when carrying out medical procedures. Nurse compliance in using Personal Protective Equipment (PPE) is influenced by several factors, namely knowledge, attitudes, actions and good communication with the hospital or health center (Ayed, & Yusuf, 2017).

Personal protective equipment is a tool that has the ability to protect someone whose function is to isolate part or all of the human body from potential hazards in health care facilities. The types of PPE that can be provided in health care facilities according to the needs are as follows: level of protection I health workers and support workers fast responders: 3 ply surgical masks, disposable rubber gloves, doctors and nurses: 3 ply surgical masks, gloves disposable rubber. Protection level II for health workers: 3 ply surgical masks, disposable rubber gloves, face shield and headcap. Protection level III for health workers: N95 masks, gowns, boots, eye protection, face shields, disposable sterile rubber surgical gloves, headcap and apron (Deviyanti, 2021).

Nurses' attitudes towards behavior in using PPE compared to research conducted by Udin (2012), showed that nurses' attitudes were balanced, between nurses' behavior in using PPE has a significant and balanced relationship between positive and negative attitudes. This has an impact on the behavior of nurses in using PPE, in accordance with the attitude theory which states that individual attitudes are the beginning of the realization of individual actions or behavior (Hudaniah, 2003).

The availability of complete PPE in a workplace is not a guarantee for every worker who will use it, this is influenced by several factors which are the reasons for them to use PPE. As for the factors that influence the behavior of using PPE in nurses while working, according to (Pambudi, Winarno and Dwiyoogo, 2019) behavior is influenced by 3 factors, namely predisposing factors, including knowledge, attitudes, actions, cultural systems, and educational levels. Enabling

factors include the availability of facilities and infrastructure that support health services and reinforcing factors include attitudes of health workers and regulations/policies (Pakpahan dkk, 2021).

Based on data obtained from the Covid-19 handling team at the Waena Health Center from January to June 2021, 587 people were recorded positive for Covid-19 in the Waena Village, 307 people in the Yabansai Village, and 18 people tested positive for Covid-19 in Waena Village. So that the total number of people who are positive for Covid-19 in the working area of the Waena Health Center is 912 people. Many Covid-19 patients carry out independent isolation or receive treatment at the hospital (Waena Health Center, 2021).

Based on the description above, the researcher is interested in conducting research related to "Factors influencing compliance of health workers using PPE in the era of the Covid-19 pandemic at the Waena Health Center". Recalling that PPE and compliance with its use are urgently needed to prevent the spread of Covid19 to all health workers working at the Waena Health Center.

## RESEARCH METHOD

In this research, analytic descriptive research was conducted using a cross-sectional design. The population in this study were all health workers working at the Waena Health Center in 2021. The sample in this study was 51 people who were calculated using the slovin formula with a standard error of 5%. The data collection technique was carried out using a simple random sampling technique. The research was conducted in July-August in the Work Area of the Waena Health Center in 2021. This research was conducted in the Work area of the Waena Health Center in 2021. This study used 3 types of questionnaires related to demographic data, knowledge, attitudes, availability of PPE, and adherence to use PPE uses an observation sheet. Data processing after all the data on the questionnaire sheet has been collected, data processing is carried out through several stages, namely editing, coding, entry, scoring, and tabulating. Data analysis with variate and bivariate analysis.

## RESULTS AND DISCUSSIONS

### Results

The following is a table of the factors that influence compliance Health workers use Personal Protective Equipment (PPE) in the pandemic era Covid-19 at the Waena Health Center in 2021.

**Table 1.** Relationship of Respondents' Knowledge Variable with Compliance with PPE Use

Variabel	Obedience				Total		p
	Not Obey		Obey		n	%	
	n	%	n	%			
Knowledge							0.027
Low	0	0.0	23	100.0	23	100	
High	6	21.4	22	78.6	28	100	
Total	6	11.8	45	88.2	51	100	

*Primary Data Source, 2021*

Table 1. Shows the results that respondents with less knowledge and disobedience related to compliance with the use of PPE were 0 people (0.0%) and respondents with less knowledge but obedient were 23 people (100.0%). As for respondents with high knowledge but not obedient as many as 6 people (21.4%) and respondents with high knowledge and obedience as many as 22 people (78.6%). The results of the Fisher's Exact Test showed a value of  $p = 0.027$ .

**Table 2.** The Variable Relationship of Respondents' Tenure with Compliance with the Use of PPE

Variabel	Obedience				Total		OR	p
	Not Obey		Obey				95% CL	
	n	%	n	%	n	%		
Years of Service							8.000	0.042
< 3 Years	3	37.5	5	62.5	8	100	(1.257-50.917)	
> 3 Years	3	7.0	40	93.0	43	100		
Total	6	11.8	45	88.2	51	100		

Primary Data Source, 2021

Table 2 shows that respondents who have worked < 3 years but disobedience related to compliance with the use of PPE as many as 3 people (37.5%) and respondents who have worked < 3 years and 5 people comply (62.5%). Whereas for respondents who have worked > 3 years but not compliant as many as 3 people (7.0%) and respondents who have worked > 3 years and are compliant as many as 40 people (93.0%). The Fischer's Excac Test results show the p value = 0.042 < 3 years has a high risk of 8,000 times to be non-compliant with PPE compared to someone who has worked > 3 years.

**Table 3.** Relationship of Respondents' Attitude Variables with Compliance with the Use of PPE

Variabel	Obedience				Total		OR	p
	Not Obey		Obey				95% CL	
	n	%	n	%	n	%		
Attitude							0.057	0.006
Not Good	1	2.8	35	97.2	36	100	(0.006-0.547)	
Good	5	33.3	10	66.7	15	100		
Total	6	11.8	45	88.2	51	100		

Primary Data Source, 2021

Table 3. Shows that in the attitude variable, 1 person (2.8%) had a bad attitude and was not obedient related to compliance with the use of PPE and 35 respondents (97.2) had a bad attitude but were obedient. Meanwhile, 5 respondents (33.3%) had a good attitude but disobeyed and 10 respondents (66.7%) had a good attitude and obeyed. The results of the Fisher's Exact Test showed a value of p = 0.006

**Table 4.** Relationship between PPE Availability Variables and Compliance PPE use

Variabel	Obedience				Total		OR	p
	Not Obey		Obey				95% CL	
	n	%	n	%	n	%		
Availability PPE							8.000	1.000
Complete	1	10.0	9	90.0	10	100	(0.083-7.727-50.917)	
Not Complete	5	12.2	36	87.8	41	100		
Total	6	11.8	45	88.2	51	100		

Primary Data Source, 2021

Table 4 shows that in the PPE availability variable, 1 person (10.0%) stated that the availability of PPE was incomplete and disobedient related to compliance with the use of PPE, and 9 respondents who stated that the availability of PPE was incomplete but obedient were 9 people (90.0%) ). As for the respondents who stated the availability of complete PPE but did not comply with it, there were 5 people (12.2%) and the respondents who stated the availability of complete PPE and complied with it were 36 people (87.8%). Fisher's Exact Test results show the value of p = 1,000 > 0.05 which means that there is no effect of the availability of PPE on the use of PPE in the era of the Covid-19 pandemic at the Waena Health Center. With an OR value of 0.800 with a Lower value of 0.083 and an Upper 7.727 containing the number 1 so that the OR value is not statistically significant.

## Discussions

### **The effect of knowledge on the compliance of health workers using Personal Protective Equipment in the Covid-19 pandemic era at the Waena Health Center**

Based on the results of the study, the results showed that from 51 respondents 0 people (0.0%) had less knowledge and were disobedient and 23 people (23%) had less knowledge but adhered to using Personal Protective Equipment (PPE). Whereas for respondents who have high knowledge but do not comply as many as 6 people (21.4%) and 22 people (78.6%) with high knowledge and obey using Personal Protective Equipment (PPE). The results of statistical analysis using the Fisher's Exact Test obtained a value of  $p = 0.027$  which means ( $p \text{ value} = 0.027 < \alpha 0.05$ ) then  $H_0$  is rejected and  $H_a$  is accepted. So, it can be stated that there is an effect of the knowledge possessed by health workers on compliance with the use of Personal Protective Equipment (PPE) in the Covid-19 pandemic era at the Waena Health Center.

The results of this study are in line with the theory by Notoatmodjo quoted by Azzahri & Ikhwan (2019) in a study entitled the relationship between knowledge about the use of Personal Protective Equipment (PPE) and compliance with the use of PPE in nurses at the Kuok Health Center which states that knowledge is the result of knowing someone and occurs after people observe and sense certain objects. In addition, knowledge is very important in shaping one's behavior. Knowledge of the use of PPE is an important aspect as an understanding of the importance of implementing the use of PPE for workers.

In addition, this research is also supported by Fahri's research, 2013 cited by Lira Mutfi et al. (2019) in their research it was stated that knowledge about PPE by health workers at the Puskesmas is everything that is known by health workers regarding the use of PPE to protect themselves from transmission of infection, transmission from health workers to patients (nosocomial infections) including the use of head protective equipment, masks, eye protection, protective clothing, gloves/handscon and footwear in every action.

According to the researchers, respondents who had high knowledge but did not comply with using PPE while working because their level of awareness of the importance of wearing full PPE was still low and considered using PPE only during emergencies. Whereas respondents who lack knowledge are obedient in using PPE because even though the knowledge possessed by respondents is lacking about Personal Protective Equipment (PPE) when touching patients. Because they are afraid that if they don't wear PPE they will be infected by the disease experienced by the patient and to protect themselves from infectious diseases.

### **The influence of the tenure of health workers on the adherence of health workers to using Personal Protective Equipment during the Covid-19 pandemic at the Waena Health Center**

Based on the results of a study of 51 respondents, 3 people (37.5%) had a working period of 3 years and were not compliant, 3 people (7.0%) and 40 people (93.0%) had a working period of >3 years but were compliant use personal protective equipment (PPE). The results of statistical analysis using the Fisher Exact Test obtained the results of a value of  $p = 0.045$  which means ( $p \text{ value} = 0.045 < \alpha 0.05$ ) then  $H_0$  is rejected and  $H_a$  is accepted. So, it can be stated that there is an effect of the tenure of health workers on compliance with the use of Personal Protective Equipment (PPE) in the era of the Covid-19 pandemic at the Waena Health Center.

The results of this study are in line with research conducted by Yunita Sapitri et al (2020) in a study which stated that most of the new working period was 24 people (60%). According to the data, 75% have had a new working period, this proves that health workers whose new working period does not have experience and have not responded quickly to the risks and signs of work accidents in the workplace because experience in this matter increases alertness. Other than that according to Anderson's theory in Notoadmodjo (2012) that, where he is the longer a person's work experience, the more skilled he is, and usually the longer it is easier for him to understand the task, thus providing opportunities to increase achievement and adapt to one's environment with more experience. obtained will be better.

According to Nurul, Indah, & Asrita (2021) in his research stated that tenure has a significant relationship with compliance with the use of PPE with a p value = 0.028 (p value < 0.05). Where in this study it was also explained, if someone has worked for > 3 years then he will be better trained at work, be more careful and they will always think about their own safety and health by using PPE. This will lead to initiatives to be more vigilant and always use the right PPE in the right situations.

In this case, according to researchers, the length of service will have an influence on compliance with the use of PPE for the health workers themselves. Where if the longer a person's working period will increase their work experience, and will know and understand more about the environmental conditions in which they work. After many things are found, it will increase the compliance of a health worker itself, and there will be self-awareness related to the importance of using PPE.

### **The influence of the attitude of health workers on compliance with the use of Personal Protective Equipment in the Covid-19 pandemic era at the Waena Health Center**

Based on the results of research on 51 respondents, 1 person (2.8%) had a bad attitude and was disobedient and as many as 35 people (97.2%) had a bad attitude but obeyed using Personal Protective Equipment (PPE). Whereas 5 people (33.3%) had a good attitude but disobedient and 10 people (66.7%) had a good attitude and obeyed using Personal Protective Equipment (PPE). The results of statistical analysis using the Fisher's Exact Test obtained the results of a value of  $p = 0.006$  which means ( $p \text{ value} = 0.006 < \alpha 0.05$ ) then  $H_0$  is rejected and  $H_a$  is accepted. So, it can be stated that there is an effect of the tenure of health workers on compliance with the use of Personal Protective Equipment (PPE) in the era of the Covid-19 pandemic at the Waena Health Center.

The results of this study are in line with those conducted by ZA, Syafrawati, and Fizikriy, (2021) in her research which stated that out of 125 respondents who had more negative attitudes (62.5%), some of them had negative behavior in using PPE, compared to respondents who behaved positively (37.5%) in the use of PPE. Meanwhile, there were more respondents with a positive attitude (82.6%), some of whom had less behavior (17.4%) in using PPE. So that a significant relationship was obtained between attitudes and behavior in using PPE in health workers at Banjarbaru Hospital with the results of the Fisher's Exact Test statistical test ( $p \text{ value} = 0.001$ ).

According to Maharani & Wahyuningsih (2017) stated that there is a relationship between attitudes and the use of PPE with a p value = 0.007 (p value < 0.05). The thing to remember is that attitude is a reaction or response of someone who is still closed to a stimulus or object. Attitudes actually show a response to the appropriateness of the reaction to a particular stimulus. Attitude is not yet an action or activity, but attitude is a predisposition to action or behavior. Attitude is a means to an end. If the attitude object can help a person achieve his goals, then the person will have a positive attitude towards the object. Conversely, if the object of attitude hinders the achievement of the goals that have been set, then people will have a negative attitude towards the object of the attitude itself.

According to researchers, the attitude of health workers is one of the factors in achieving adherence to the use of PPE for health workers in particular. Because most health workers already know the benefits of using PPE itself, but some are still unable to be good at implementing it.

### **The effect of the availability of Personal Protective Equipment on compliance with the use of Personal Protective Equipment for health workers in the Covid-19 pandemic era at the Waena Health Center.**

Based on the results of research on 51 respondents, 1 person (1.00%) stated that the availability of PPE was incomplete and disobedient and 9 people (9.00%) stated that the availability of PPE was incomplete but complied with using Personal Protective Equipment (PPE). Whereas for respondents who stated the availability of complete PPE and did not comply as many as 5 people (12.2%) and 36 people (87.8%) stated the availability of complete PPE and adhered to using

Personal Protective Equipment (PPE). ). The results of statistical analysis using the Fisher's Exact Test obtained the results of a value of  $p = 1,000$  which means ( $p \text{ value} = 1,000 > \alpha 0.05$ ) then  $H_0$  is accepted and  $H_a$  is rejected. So, it can be stated that there is no effect of the availability of PPE on the compliance of health workers using Personal Protective Equipment (PPE) during the Covid-19 pandemic era at the Waena Health Center.

The results of this study are in line with ZA, Syafrawati, and Fizikriy (2021) which stated that out of 125 respondents who stated that the availability of PPE was mostly more (100%), some of them had less behavior in using PPE, compared to respondents who behaved well (0% ) in the use of PPE. Whereas there were more respondents who stated that the availability of PPE was complete (75.8%) of them had good behavior in using PPE, compared to respondents who behaved less (24.2%) in using PPE. Sed = until it can be seen that there is no significant relationship between the availability of PPE and the behavior of using PPE among health workers at Banharvbary Hospital with the results of the Fisher's Excats Test statistic obtained value ( $p \text{ value} = 0.589$ ).

In addition, the research results that support the results of this study are research conducted by Putri (2014) cited by ZA, Syafrawati, and Fizikriy, (2021) where it is stated that the availability of PPE ( $p = 0.652$ ) means that there is no significant relationship with adherence to using PPE.

According to the researchers, the availability of PPE is not the most important influence in terms of implementing compliance with the use of PPE. This does not guarantee compliance for every health worker to use it. Because this will be influenced by larger factors including knowledge, attitudes or years of service of the health workers themselves.

## CONCLUSION

Based on the results of data processing and discussion above, the authors can draw conclusions, namely 1) There is a significant influence between knowledge and compliance of health workers using PPE in the Covid-19 pandemic era at the Waena Health Center with a  $p \text{ value} = 0.027 < 0.05$ ., 2) There is a significant influence between tenure and adherence of health workers to using PPE in the Covid-19 pandemic era at the Waena Health Center with a  $p \text{ value} = 0.042 < 0.05$ , 3) There is a significant influence between attitudes and adherence of health workers to using PPE in the pandemic era Covid-19 at the Waena Health Center with a  $p \text{ value} = 0.006 < 0.05$ , and 4) There was no significant effect between the availability of PPE and the compliance of health workers using PPE in the Covid-19 pandemic era at the Waena Health Center with a  $p \text{ value} = 1,000 > 0.05$ .

Based on the conclusions that have been presented by the author, the recommendations given by the author are 1) For the development of Nursing Science it is hoped that it can contribute thoughts and references to knowledge about factors that influence the compliance of health workers using Personal Protective Equipment (PPE) in the era of the Covid-19 pandemic , 2) For the Waena Health Center it is hoped that it can always optimize its health services without neglecting the safety and health of the health workers who work there, and For other researchers it is hoped that they can develop research related to adherence to the use of Personal Protective Equipment (PPE). For further research, analysis of adherence to the use of PPE can be carried out more broadly, not only during the Covid-19 pandemic, with the factors developed.

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