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Analysis of factors related to health personnel compliance with the use of personal protection equipment (PPE) during the COVID-19 pandemic

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Abstract---The role of infection prevention and control practices using personal protective equipment (PPE) is very important, especially for health workers who work on the front lines. Health workers, especially in the emergency room, are required to wear eye protection, head coverings, N95 masks or the equivalent, disposable gloves, boots and gowns that cover from head to toe. This study aims to determine what factors are related to the compliance of health workers in the use of PPE in the emergency room. The research design used a correlational research method with a cross sectional approach. The population of this study were Health Workers in the Emergency Room Dr. Ramelan Naval Central Hospital Surabaya as many as 75 people, the sample size is 75 people using total sampling analyzed using chi square correlation. The independent variables are age, years of service, workload and knowledge. The dependent variable is the Compliance of Health Workers in the use of PPE. The instrument uses a questionnaire. The results of the study showed that there was a relationship between age, working period, workload and knowledge with the compliance of health workers in using PPE in the Emergency Room Dr. Ramelan Naval Central Hospital Surabaya. The results of the chi square analysis obtained a sig value for age and working period of (0.000), workload of (0.004) and knowledge of (0.001) each <

(0.05). Nurses are expected to be used as input for developing a better and quality nursing system for the safety of health workers.

Keywords---age, working period, workload, knowledge, compliance of health workers in the use of PPE, Covid-19.

Introduction

The Corona Virus (corona / crown) or covid-19 (corona virus disease 19) is a collection of viruses and their spread is very fast and very small in size, so the government has issued a policy on the use of Personal Protective Equipment (PPE) for the general public and health workers in particular. to break the chain of distribution (Hakim, 2021). The role of infection prevention and control practices using personal protective equipment (PPE) is very important, especially for health workers who work on the front lines. Health workers, especially in the emergency room, are required to wear eye protection, head coverings, N95 masks or the equivalent, disposable gloves, boots and gowns that cover from head to toe. (Triningtyas et al., 2021). Knowledge and workload are factors that affect compliance with the use of PPE. Health workers, if the use of PPE is not implemented properly, will have an impact on being vulnerable to the spread of the virus so that the risk of contracting Covid 19 is three times that of ordinary people, and can cause various types of transmission of other diseases.

The number of health workers who have confirmed Covid-19 in Indonesia continues to increase, this can be seen from data from the Indonesian National Nurses Association (PPNI) on September 16, 2020 which recorded that there were 2,983 Indonesian nurses confirmed positive for Covid-19. PPNI details that there are four provinces with confirmed records of Covid-19 nurses, including DKI Jakarta which contributed the highest number of positive nurses, namely 1,629 cases. Then East Java 848 cases, Bali 156 cases, and South Sulawesi 350 cases. Based on data from the Mitigation Team of the Indonesian Doctors Association, from March to December 2020, as many as 342 health workers consisting of 192 doctors, 14 dentists, and 136 nurses died due to being infected with the Covid-19 virus (Ansori, 2020). Initial research on health workers from 75 health workers in the ER Dr Ramelan Hospital, Surabaya, some 60 health workers comply with the use of PPE and 15 health workers are less compliant in the use of PPE, 15 health workers who are less compliant in the use of PPE there are 8 health workers exposed to covid 19 and from 60 health workers who are obedient in the use of PPE, there are still 5 people exposed to Covid 19. This is because even though they are obedient in the use of PPE, their release or use does not meet the standard operating procedures for using PPE, such as removing gloves while handling patients.

Factors that affect the compliance of health workers in the use of PPE include age, years of service, workload, knowledge. (Triningtyas et al., 2021). In the Covid 19 Pandemic Era there was an increase in the level of compliance with the use of PPE by health workers. Health workers with better knowledge used PPE more than health workers who had sufficient knowledge. This is in accordance with the theory which states that the better one's knowledge, the better the level of one's

awareness and discipline in receiving and applying the message or information conveyed. Compliance in the use of PPE is defined as obedience to carry out the use of PPE against a recommendation, procedure or regulation that must be carried out or obeyed (Putri & Denny, 2014). Proper use of PPE includes proper selection of the appropriate type of PPE, how to use it, how to remove it and how to dispose or wash PPE.

Putri's research (2021) stated that the results of the study were that most of the respondents did not use PPE according to the SOP, as many as 20 people (57.1%). The lack of use of PPE is due to the lack of personal protective equipment in hospitals due to various factors. The lack of use of PPE is one of the factors that facilitate the transmission of disease agents from patients to health workers or vice versa. PPE serves to protect health workers against hazards that can interfere with health in their work environment. Fridalni and Rahmayanti's research (2021) states that there is a relationship between knowledge and behavior of nurses in the application of PPE to the prevention of nosocomial infections in the Inpatient Room of RSUD Dr. Rasidin Padang in 2018 ($p = 0.043$), there is a relationship between attitudes and behavior of nurses in the application of PPE to the prevention of nosocomial infections ($p = 0.000$) and there is a relationship between facilities and infrastructure with the behavior of nurses in the application of PPE to the prevention of nosocomial infections ($p = 0.012$). It is recommended to hospitals to be able to change the attitude of nurses about the importance of using PPE according to SOPs in good and correct inpatient rooms by confirming the rules for using PPE in each room. Yotley's research (2019) entitled "Analysis of Factors Relating to Nurse Compliance in the Application of Standard Precautions at the Piru Hospital" found that there was a significant relationship between individual factors of knowledge and the application of standard precautions and there was no relationship between individual factors' perceptions of risk and compliance in standard application. Delgado et al (2020) stated that people who are at risk of being infected are people who are close to patients or health workers (nurses) who treat COVID-19 patients. Nurses are currently at significant risk of contracting infection so it is important for nurses to protect themselves from exposure to the virus.

As an effort to minimize the spread of the Covid-19 virus to health workers, the hospital conducts training and outreach related to the use of personal protective equipment (PPE) to health workers, especially in the emergency room, the hospital also ensures the completeness and availability of PPE in every room, especially the room. The emergency department is an effort to standardize nurses' awareness in carrying out their roles as nursing care providers. The purpose of this study is to analyze the factors related to the compliance of health workers in the use of PPE.

Method

The design of this study used a correlational research method with a cross sectional approach. The population in this study were health workers in the emergency room of the Dr. Ramelan Naval Central Hospital Surabaya as many as 75 people. The sampling method in this study was carried out by the total sampling method. Sample size was taken from the entire population, namely as

many as 75 health workers. The place of research was carried out in the Emergency Room of the Dr. Ramelan Naval Central Hospital Surabaya. The research period starts from April to May 2022. The data collection instrument in this study was using a questionnaire about age, years of service, workload, knowledge and compliance of health workers in the use of PPE.

The age questionnaire has 3 classifications, namely < 35 years, 36-45 years, > 45 years. The working period questionnaire is divided into 2, namely < 3 years, > 3 years. The workload questionnaire has a classification of 13 - 20 = no load, 21-30 = light load, 31-40 = moderate load, 41-52 = heavy load. The knowledge questionnaire has a score of 1 if it is true and 0 if it is false. the categories in the knowledge questionnaire are Good (76 - 100%), Enough (56 - 75%), Less (< 56 %). The compliance questionnaire referring to PPE level 3 is required for health workers working in the emergency department with a classification of compliance: obedient = 7, non-compliant <7. This research has passed the ethics of the Research Ethics Committee of the Dr. Ramelan Naval Central Hospital No.09/EC/KEP/2022

Discussion

Results in this study are shown at this table

Table 1
Demographic of respondents

Variable	Category	f	%
Gender	Man	51	68
	Woman	24	32
Education	D3 Nursing	50	66.7
	S1 Nursing	25	33.3

Table 2
Relationship of Age with Compliance in using PPE

Variable	Category	Compliance	Non-Compliant
Age	≤ 35 years	12 (48%)	13 (52%)
	36 – 45 years	43 (93.5%)	3(6.5%)
	> 45 years	4 (100%)	0(0%)
Analysis Chi Squire p= 0.000 < α (0.05)			

Table 3
Relationship of Working Period with Compliance in using PPE

Variable	Category	Compliance	Non-Compliant
Working Period	≤ 3 years	19 (59.4%)	13 (40.6%)
	> 3 years	40 (93%)	3 (7%)
Analysis Chi Squire p= 0.000 < α (0.05)			

Table 4
Relationship of Work Load with Compliance in using PPE

Variable	Category	Compliance	Non-Compliant
Work Load	No burden	1 (100%)	0 (0%)
	Light	34(94.4%)	2 (5.6%)
	Currently	24 (64.9%)	13 (35.1%)
	Heavy	0 (0%)	1 (100%)
Analysis Chi Squire p= 0.004 < α (0.05)			

Table 5
Relationship of Age with Compliance in using PPE

Variable	Category	Compliance	Non-Compliant
Knowledge	Good	13 (100%)	0 (0%)
	Enough	39 (83%)	8 (17%)
	Less	7 (46.7%)	8 (53.3%)
Analysis Chi Squire p= 0.001 < α (0.05)			

Based on table 2, the relationship between age and compliance in using PPE for health workers, it was found that with age <35 years, more than half of them did not comply with using PPE, namely as many as 13 health workers (52%), in health workers aged 36-45 years, most of them obeyed using PPE. that is as many as 43 health workers (93.5%), health workers with age > 45 years are generally obedient to using PPE as many as 4 health workers (100%). 0.05) means that there is a relationship between age and compliance in using PPE for health workers in emergency room of the Dr. Ramelan Naval Central Hospital Surabaya. Age is closely related to a person's level of maturity. The higher the age, the more capable of showing mental maturity and the more able to think rationally, the wiser being able to control emotions and the more open to the views of others. This is reinforced by the theory of Robbins et al, (2006) which says that the older you get, the more experience you see, strong work ethic considerations, and a commitment to quality.

The older a person is, the better the knowledge of nurses will be because during that age nurses daily in receiving information about the use of PPE are increasingly embedded in their minds so that the use of PPE is an important thing for those who have good knowledge, this is in accordance with previous research according to research Prasetyo in 2015 stated that knowledge can be obtained in everyday life while at work. Based on table 3, the relationship between work period and compliance in using PPE. In health workers, it was found that the work period of < 3 years was more than half of them complied with using PPE, namely 19 health workers (59.4%), in health workers with a working period of > 3 years, most of them complied. using PPE as many as 40 health workers (93%). Based on the results of the chi square correlation analysis, the p value of 0.000 < (0.05) means that there is a relationship between years of service and compliance in using PPE for health workers.

The term of service is the length of time a nurse works in an organization, that is, from the start the nurse is officially declared an employee or employee of a hospital. The longer a person works, the more skilled and experienced he will be in carrying out his work. Notoadmodjo (2017) says that the longer an employee works, the lower the employee's desire to leave his job. The experiences gained by the nurse while she was at work, the better the experience gained, for example in nurses who worked > 10 years, more information about the importance of using PPE, so the nurse considered the use of PPE was important. According to Weykola's 2012 research, differences in the tenure of nurses have an impact on compliance in each nurse so that it allows nurses to know about the use of personal protective equipment while working.

Based on table 4, the relationship between workload and compliance in using PPE for health workers, the results obtained that health workers with no workload are generally compliant with using PPE, namely 1 health worker (100%), health workers with light workloads are mostly obedient to using PPE. PPE, namely as many as 34 health workers (94.4%), for health workers with moderate workloads more than half comply with using PPE, namely as many as 24 health workers (64.9%), in health workers with heavy workloads overall do not comply with using PPE namely 1 health worker (100%). Based on the results of the chi square correlation analysis, the p value of $0.004 < (0.05)$ means that there is a relationship between workload and compliance in using PPE in health workers. Workload is the amount of work that must be carried out by a position or organizational unit and is the product of the work volume and normal time. Shift work is a pattern of working time given to workers to do something by the company and is usually divided into morning, afternoon and evening work. The proportion of shift workers is increasing from year to year, this is due to the investment spent, as a result nurses also have to work day and night, this creates many problems, especially for health workers who are unable or less able to adjust to the usual working hours.

Nurses face various difficulties in their work, such as work overload, treatment errors, unstable nurse image, decreased compliance in the use of PPE, and work discomfort. Motivation and its factors are effective ways to improve nurse performance (Susanti, 2014). Basu et al (2012) in their research entitled "Comparative Performance of Private and Public Healthcare Systems in Low- and Middle-Income Countries: A Systematic Review" found that every health facility must be efficient, accountable, and effective by preparing a motivational plan for health workers to develop and ensure their job satisfaction. Thus, nurses will be able to survive in their work and be able to overcome their shortcomings.

Based on table 5, the relationship between workload and compliance in using PPE for health workers, it was found that health workers with good knowledge were generally compliant with using PPE, namely as many as 13 health workers (100%). 39 health workers (83%), about half of knowledge health workers do not comply with using PPE, namely as many as 8 health workers (53.3%). Based on the results of the chi square correlation analysis, the p value of $0.001 < (0.05)$ means that there is a relationship between knowledge and compliance in using PPE for health workers. Carayon and Ayse (2008) state that high workload conditions can make it more difficult for nurses to follow rules and guidelines, thereby reducing the quality of providing nursing services to patients. From the

results of the analysis of the statements in the questionnaire used to measure the workload, it was found that most of the respondents agreed that their work requires respondents to work hard, almost half of the respondents answered agreed that their work requires respondents to work hard and almost half of the respondents answered quite agree that respondents should complete a lot of work in a narrow time so that it can be concluded that the respondents have a high workload. Carayon and Ayse (2008) which state that according to the concept of nurse workload, the level of nurse workload depends on the condition of the patient in each treatment room which can have an impact on the nurse's performance in the application of standard precautions.

Conclusion

There is a relationship between age, period of work, workload and knowledge of compliance with the use of personal protective equipment in health workers. It is hoped that this research can be used as input for developing a better and quality nursing system for the safety of health workers and patients.

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