

Factors Affecting Nurses' Non-compliance Behavior in Using Personal Protective Equipment (PPE) during the COVID-19 Pandemic: Literature Review

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Abstract:- COVID-19 is one of the viruses that can cause respiratory tract infections in humans ranging from coughs and colds to more dying problems, such as MERS and SARS. The hospital is one of the means of transmission for other people so that it becomes a special concern in the application of the use of PPE. The use of PPE correctly or according to established standards can minimize the risk of transmission rates. However, there are still some health workers who are categorized as lacking in the proper use of PPE. The purpose of this study is to find out what factors can affect nurses' non-compliance in using Personal Protective Equipment (PPE) during the COVID-19 Pandemic. The method used in this study is a systematic review through a review of journals or articles accessed from internet database searches. *PubMed*, *Ebsco* and *Google scholar*. This study analyzed 10 international articles that were selected based on the criteria of the PRISMA protocol. The results obtained are that many health workers do not comply with the use of PPE. In the results of a literature review of 10 articles, it is known that there are many factors that influence a nurse's non-compliance in using PPE, one of which is the most dominant being knowledge of the use of PPE according to standards which is still minimal due to lack of special training in the use of PPE during the Covid-19 pandemic. This is also evidenced by research which shows that there are still many health workers who remove PPE incorrectly or not according to applicable SOP standards, so special training and strict supervision of health workers are needed. Increased knowledge can increase the level of nurse compliance with the use of personal protective equipment.

Keywords:- *Protective Equipment (PPE), PPE Usage Compliance, Nurse, COVID-19, Characteristics, Coronavirus Disease (COVID- 19), Disaster.*

I. INTRODUCTION

The risk of infection in hospitals is a global health problem known as nosocomial infection. The spread of nosocomial infections can be through spread from one patient to another, as well as with health workers who will be more often exposed to infectious agents. Transmission can be in several ways, namely through air, blood, and body fluids such as tuberculosis, varicella, diphtheria, influenza, morbilli, meningitis, scarlet fever, mumps or known as epidemic parotitis, rubella, SARS, HIV/AIDS, hepatitis The Mers Virus and currently developing is the Corona Virus or COVID-19 (WHO, 2020).

COVID-19 has become one of the world's health problems since January 2020. Since then, the COVID-19 case has shocked the world with a level of concern that is quite life-threatening which continues to grow until 3,272,202 cases are confirmed and data is obtained as many as 230,104 deaths that afflict 215 countries. (Selina Alta E et al, 2020). In Indonesia itself, COVID-19 was first confirmed on March 2, 2020, and until now COVID-19 cases have continued to grow and have finally begun to weaken health care workers who have been confirmed to have been exposed to the COVID-19 virus in various regions (WHO, 2020).

One of the efforts made by hospitals in preventing the transmission of infectious diseases is to provide and implement related to the use of personal protective equipment in accordance with standardized policies. Personal protective equipment aims to protect themselves from the invasion of pathogenic microbes that try to enter through the mucosa of the mouth, nose and eyes through the intermediary of the hands. The PPE that we often see in hospitals is in the form of gloves, masks, google (protective glasses), face shields (face shields) and also medical gowns. The PPE is used based on indications of the type and each PPE itself (Kemenkes RI, 2017). Experts also agree with the use of PPE which is considered very important in protecting oneself from exposure to contaminated droplets or liquids that can transmit to health workers. Pandemic during the COVID-19 Pandemic.

Based on this background, the reviewer tries to conduct a literature review on several research articles to identify factors that influence nurses' non-compliance in using personal protective equipment (PPE) during the COVID-19.

II. METHODS

A. Data Source

Sources Relevant data sources come from 3 databases, namely *PubMed*, *Science Direct* and *Google scholar*. Articles were selected based on inclusion criteria and followed the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analysis*) for critical evaluation of each article.

B. Search Strategy

Search was conducted in August 2021. Several keywords were used to find relevant articles in this review, which consists of "Protective Equipment (PPE)" or "PPE Usage Compliance" "Nurse" and "Covid-19". Articles related to factors that influence nurses' non-compliance in using personal protective equipment (PPE)

during the COVID-19 pandemic are aimed at accessing information.

C. Inclusion

Criteria Inclusion criteria in this study include: (1) *Full text* that are free of charge and in English; (2) Publications for the last 5 years (2015-2019) (3) nurse behavior that increases nurse compliance in using personal protective equipment (4) Original artical.

D. Exclusion

Criteria The exclusion criteria in this study include: Articles whose abstracts do not use English and the articles displayed are not full text.

III. RESULTS

Based on the search results from 3 databases, 29 articles were found that were considered relevant to the keywords. 13 articles from *Sciene Direct*, 10 from *Pubmed*, 6 from *Google Scholar*, according to the research topic. The search was then narrowed down by limiting publications to the last 5 years (2015-2021), the number of articles found was 18 articles.

After screening by reading the title of the research abstract, the *full text* that meets the requirements is obtained. In the end, based on the inclusion criteria, only 12 articles could be continued for analysis. The reasons for removing 6 articles from the *review*, namely articles in the form of literature reviews, inappropriate populations, not conducted in health services, and in the form of research protocols. After assessing the quality of the study on 12 articles that were categorized as good, then data extraction was carried out. Data extraction was carried out by analyzing and based on the author's name, title, purpose, research method and duration of intervention, number of samples and research results according to the topic. Then it was successfully obtained 10 selected articles, including 3 from *Sciene Direct*, 3 from *Pubmed*, and 4 from *Google Scholar* which were used for data analysis. From the articles that have been analyzed, the results show that there are still many compliance behaviors in using personal protective equipment, especially during the COVID-19 pandemic.

A complete explanation of the article's eligibility search strategy as well as the articles included in the analysis can be illustrated through the following prismatic flow:

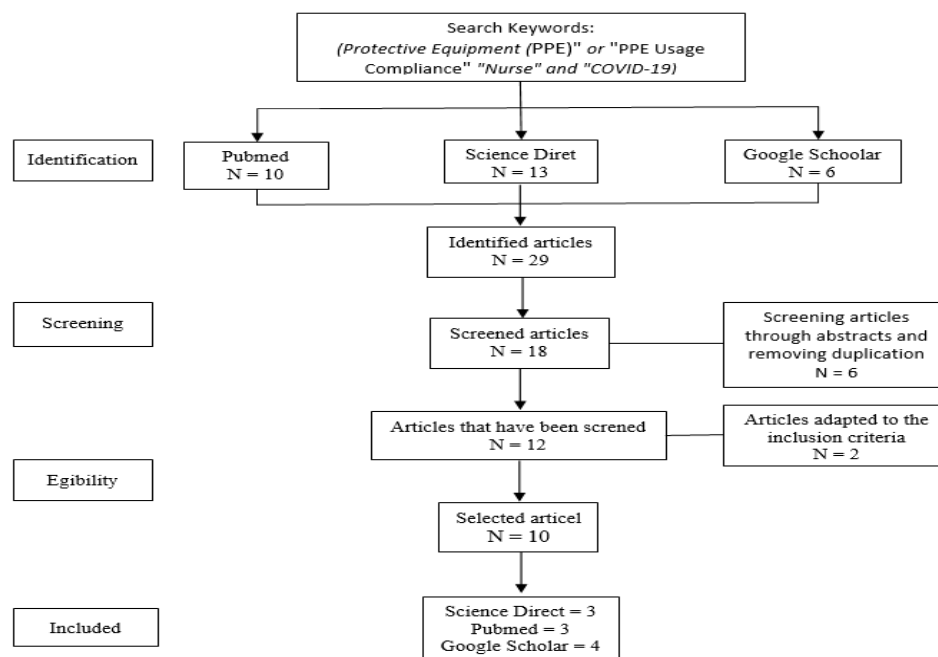


Chart 1: Search Strategy Summary

Source: Primary Data, 2021

No	Author/Year	Journal Title	Purpose	Method	Number of samples	Result
1.	(Alsahafi & Cheng, 2016)	<i>Knowledge, Attitudes and Behaviours of Healthcare Workers in the Kingdom of Saudi Arabia to MERS Coronavirus and Other Emerging Infectious Diseases</i>	Assess the knowledge, attitudes, practices in infection control, and educational needs of health workers in the Kingdom of Saudi Arabia against MERS coronavirus and other new infectious diseases.	<i>Cross Sectional</i>	Health workers from the Saudi Ministry of Health, consisting of 1216 health workers, were included in the survey. 56.5% were nurses and 22% were doctors invited to fill out a questionnaire developed to include: survey objectives from September 9, 2015, to November 8, 2015.	Knowledge of emerging infectious diseases is still low and there is a need for further education and training programs, especially in the use of PPE with the presentation results obtained from 1216 health workers who were included in this survey had a level of knowledge (47.6%) doctors, (30.4%) nurses and (29.9%) other health workers. This proves that the nurse's knowledge level is still low.
2	(Philippe, et al., 2020)	<i>Healthcare workers' perception of a global outbreak of novel coronavirus (COVID-19) and personal protective equipment: Survey of a pediatric tertiary care hospital</i>	Assess the perspectives of health officials on Coronavirus disease 2019 (Covid-19) and infection prevention and control measures (IPAC) implemented during the initial phases of the COVID-19 pandemic.	<i>Cross Sectional</i>	In total, a sample of 175 health workers consisting of 35 physician staff, 24 residents or associates, 72 nurses, 14 respiratory therapists, 14 administrative staff, 14 other employees, and 1 unknown were observed.	Only 60 respondents (35%) indicated the correct order of <i>doffing PPE</i> as per regulatory recommendations. Health care institutions should conduct ongoing training.
3	(Chughtai, et al., 2016)	<i>Compliance with the Use of Medical and Cloth Masks Among Healthcare Workers in Vietnam</i>	Looking at the factors influencing the adherence to the use of medical masks and cloth among hospital health workers.	<i>Cross Sectional</i>	1149 health workers	The level of adherence to medical masks and cloth decreases and the presence of adverse events such as discomfort and respiratory problems.
4	(Kyungnam & Ogcheol, 2016)	<i>Knowledge, Attitudes and Perceptions of Nurses on Personal Protective Equipment: Response to the Middle East Respiratory Syndrome Coronavirus</i>	Identify nurses' knowledge, attitudes, and perceptions of PPE.	<i>Cross Sectional</i>	154 nurses in tertiary public hospitals in Korea	The use of safety goggles, and powered air-purifying respirators (PAPR) is considered the most uncomfortable barrier to work.
5	(Kumar, et al., 2020)	<i>Knowledge, Attitude, and Practices of Healthcare Workers Regarding the Use of Face Mask to Limit the Spread of the New Coronavirus Disease (COVID-19)</i>	Knowing the knowledge, attitudes, and practices of health workers in wearing surgical masks to limit the spread of the new coronavirus disease 2019.	<i>Cross Sectional</i>	392 health workers. The survey was conducted by interviewing health workers using a questionnaire consisting of basic demographic characteristics, as well as knowledge, attitudes, and practices of wearing surgical masks to limit new exposure to COVID-19.	Health workers' knowledge, attitudes, and practices about mask wearing turned out to be inadequate. About 43.6% of participants knew how to wear a mask correctly, 68.9% knew there were three layers, 53% said the middle layer functioned as a barrier to the filter media, and 75.5% knew the maximum recommended duration of use.
6	(Ekpenyong, et al., 2020)	<i>Assessment of Knowledge, Practice and Guidelines towards the Novel COVID-19 among Eye Care Practitioners in Nigeria-A Survey Based Study</i>	to explore the knowledge, risk practices and guidelines of novel coronavirus (COVID-19) infection among eye care practitioners and potential related factors.	<i>Cross Sectional</i>	823 respondents in Nigeria consisting of ophthalmologists, ophthalmologists, and so on.	The ECP in Nigeria displays a good knowledge of COVID-19 and provides eye care services during the COVID-19 pandemic in Nigeria, although the majority do not receive any training on the use of PPE with concerns about treating patients. Thus, the government needs to strengthen the health system by improving standard infection prevention training and effective pandemic control (including training in the use of good and correct PPE according to standards).

7	(Ahmed, et al., 2020)	<i>Knowledge, Awareness and Practice of Health care Professionals amid SARS-CoV-2, Corona Virus Disease Outbreak</i>	To assess the level of knowledge, awareness, and practice of health workers towards Corona virus Disease - 2019 (COVID-19).	<i>Cross Sectional</i>	810 healthcare workers were given training and distributed a structured questionnaire consisting of three parts including knowledge, attitudes, and practices among healthcare professionals in various hospitals and clinics, during the two months 'Feb-March' 2020.	(73%) participants did not come to any lecture, workshop, or seminar on COVID-19 for the purpose of increasing knowledge and awareness.
8	(Suppan, et al., 2020)	<i>Effect of an E-Learning Module on Personal Protective Equipment Proficiency Among Prehospital Personnel: Web-Based Randomized Controlled Trial</i>	Evaluate whether gamified e-learning modules can improve adequate PPE levels of choice by pre-hospital personnel in the context of the coronavirus disease (COVID-19) pandemic.	<i>RCT</i>	The 291 participants were randomly drawn and divided into two groups then given pre-intervention quizzes designed to build their profile and basic knowledge. The control group then accesses the guidelines before answering the second set questions, and then granted access to e-learning modules.	The provision of the E-learning module can increase the ability of health workers to use PPE.
9	(Susiladewi, Yanti, & Pradiksa, 2020)	<i>The effect of training and video provision on nurses' knowledge of personal protective equipment during the 2019 coronavirus disease pandemic</i>	to analyze the effect of training and video delivery on nurses' knowledge of personal protective equipment during the Coronavirus Disease 2019 pandemic.	<i>RCT</i>	The study participants were 210 nurses at the Technical Implementation Unit (UPT) of the Bali Mandara Regional General Hospital (RSUD) who were selected using <i>purposive sampling techniques</i> . Questionnaires were given to respondents before and after the implementation of the intervention.	The results of the Wilcoxon test obtained a p value of 0.000, meaning that there is an effect of training and video provision on nurses' knowledge of personal protective equipment during the Coronavirus Disease 2019 pandemic. Based on the results of this study, training and video provision can be used as an effective program to be able to increase nurses' knowledge about personal protective equipment during the Coronavirus Disease 2019 pandemic.
10	(Puspitasari, Yusuf, Sinuraya, Abdulah, & Koyama, 2020)	<i>Knowledge, Attitude, and Practice During the COVID-19 Pandemic: A Review</i>	Presents a summary of knowledge, attitudes, and practices during the COVID-19 pandemic among healthcare workers.	<i>A review</i>	Presents 7 selected articles in KAP during COVID-19. The article used the questionnaire as an instrument with the number of respondents ranging from 240 to 6910 for a total of 17,487.	The analysis reveals that the level of knowledge is generally positive, and optimistic attitudes and good practices are held.

Table 1: Research Result Synthesis Matrix

Source: Primary Data, 2021

IV. DISCUSSION

Based on the analysis of the articles it was found that there were still many nurses who still lacked knowledge in the use of PPE, especially during the COVID-19 pandemic. As health workers, especially nurses, they have the most frequency to face and interact directly with various kinds of patients. Therefore, nurses must understand more about the risks and responsibilities as a health worker in maintaining the health of themselves and others, especially the patients they are dealing with. This is in line with the results of research conducted by Puspitasari, Yusuf, Sinuraya, Abdullah, & Koyama, (2020) where the better the knowledge, attitude and optimism possessed by nurses, the skills and readiness in dealing with patients during a pandemic are much more optimal and appropriate. with established standards. This can reduce the rate of transmission of infectious diseases directly or indirectly. What happens if knowledge, attitudes and practices regarding the use of personal protective equipment are still inadequate?

Some of the studies above show that nurses' compliance in using personal protective equipment is still lacking. From 6 articles, it was found that nurses' knowledge and attitudes towards the use of personal protective equipment were still very low, which was marked by the procedures, functions of using and removing masks that were not correct.

The results of research from Ekpenyong, et al, (2020) show that there are some officers who have a positive attitude but the level of knowledge and practice is still in the moderate to poor category regarding the use of personal protective equipment. In this case, it is necessary to increase knowledge in order to strengthen the awareness system and training in infection prevention by using personal protective equipment properly and correctly according to the procedures or standards provided. However, it was found in one article which showed that a person's level of awareness in attending training, workshops or seminars and the like about COVID-19 is still lacking, this causes the level of knowledge to be lacking which has an impact on attitudes and actions that are not in accordance with procedures.

V. CONCLUSIONS AND SUGGESTIONS

Nurse compliance in using personal protective equipment is strongly influenced by a person's level of knowledge. One's knowledge One's knowledge can be done by increasing training regularly and using interesting methods so that the target of improvement is achieved, such as using the *learning module* and providing videos on a regular basis, and it is highly recommended or expected to carry out regular monitoring.

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