



The Relationship Between Knowledge Level and Student Compliance in Performing Personal Protective Equipment Usage Procedures: A Study in the Department of Dental Health, Poltekkes Kemenkes Kupang

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ABSTRACT

Standard precautions play a crucial role in preventing infections among patients, healthcare workers, and practicing students. The use of personal protective equipment (PPE), such as gloves, masks, protective glasses, and protective clothing, helps prevent risks associated with needle-stick injuries, aerosol splashes, and water sprays. A preliminary study revealed that 70% of students do not comply with PPE usage, and 50% have inadequate knowledge regarding PPE. This study aims to analyze the relationship between students' knowledge levels and their compliance with PPE usage. Using an analytical observational design with a cross-sectional approach, the study involved 97 fifth-semester students undergoing practical training in the dental and oral healthcare laboratory from February to June 2024. The sample was selected using a total sampling technique, while data were collected through questionnaires, checklists, and interviews. Data analysis was performed using the Kendall Tau-b correlation test. The results showed that 52.6% of students had good knowledge of PPE, while 70.1% were categorized as compliant in its use. The Kendall Tau-b correlation test indicated a significant relationship between knowledge level and compliance with PPE usage ($p = 0.027 < 0.05$). In conclusion, higher knowledge levels about PPE are associated with greater compliance among students. Therefore, more intensive training and socialization efforts are needed to enhance students' adherence to PPE implementation.

Keywords: Knowledge, Compliance, Procedure, Personal Protective Equipment.

ABSTRAK

Kewaspadaan standar berperan penting dalam mencegah infeksi pada pasien, tenaga kesehatan, dan mahasiswa praktik. Penggunaan alat pelindung diri (APD), seperti sarung tangan, masker, kacamata pelindung, dan pakaian pelindung, melindungi dari risiko tusukan jarum suntik, percikan aerosol, serta semprotan air. Studi pendahuluan menunjukkan bahwa 70% mahasiswa tidak patuh dalam penggunaan APD, dan 50% memiliki tingkat pengetahuan yang kurang. Penelitian ini bertujuan untuk menganalisis hubungan antara tingkat pengetahuan dan kepatuhan mahasiswa dalam menggunakan APD. Menggunakan desain observasi analitik dengan pendekatan cross-sectional, penelitian ini melibatkan 97 mahasiswa semester V yang menjalani praktikum di laboratorium kesehatan gigi dan mulut pada Februari–Juni 2024. Sampel diambil dengan teknik total sampling, sedangkan data dikumpulkan melalui kuesioner, daftar periksa, dan wawancara. Analisis dilakukan menggunakan uji korelasi Kendall Tau-b. Hasil penelitian menunjukkan bahwa 52,6% mahasiswa memiliki tingkat pengetahuan yang baik tentang APD, sementara 70,1% berada dalam kategori patuh dalam penggunaannya. Uji korelasi Kendall Tau-b menunjukkan adanya hubungan signifikan antara tingkat pengetahuan dan kepatuhan dalam penggunaan APD ($p = 0,027 < 0,05$). Kesimpulannya, semakin tinggi tingkat pengetahuan mahasiswa tentang APD, semakin tinggi pula kepatuhan mereka dalam menggunakannya. Oleh karena itu, diperlukan pelatihan dan sosialisasi yang lebih intensif untuk meningkatkan kepatuhan mahasiswa dalam penerapan APD.

Kata Kunci: Pengetahuan, Kepatuhan, Prosedur, Alat Pelindung Diri.

INTRODUCTION

The infectious diseases with the highest prevalence in Indonesia, based on the Basic Health Research, include acute respiratory infections (ARI), tuberculosis (TB), hepatitis, and Human Immunodeficiency Virus (HIV) infections, which continue to increase annually (Kementerian Kesehatan Republik Indonesia, 2018). These diseases pose a high risk of transmission in dental healthcare facilities, particularly through airborne transmission and the presence of pathogenic microorganisms in the oral cavity, blood, and saliva (Rahayu, 2024). Additionally, dental healthcare workers are at risk of injuries from needle sticks or contact with patients' bodily fluids (Permana, 2021).

To reduce the risk of transmission, the implementation of health protocols and standard precautions is essential, including handwashing according to World Health Organization (WHO) guidelines and the use of personal protective equipment (PPE) when treating patients (Sefia & Koesyanto, 2021; Putri, Prahastuti, & Djaali, 2024). PPE is used to protect healthcare workers from various risks such as needle stick injuries, aerosol splashes from handpieces (manual or ultrasonic), water spray from syringes, and other dental instruments (Hakim, Alwi, & Baharuddin, 2021; Dewi & Widowati, 2022). The use of PPE in healthcare work environments is regulated under the Occupational Health and Safety Act No. 1 of 1970, Chapter IX, Article 13, which mandates that every individual entering a workplace must comply with safety guidelines and use the required PPE (Presiden Republik Indonesia, 1970).

However, initial observations of 20 students practicing in the Dental Health Department laboratory revealed low compliance with PPE usage. Ten students were unable to correctly answer questions in the PPE-related questionnaire, while 14 students demonstrated non-compliance in its usage. Some observed forms of non-compliance included 57% of students carrying gloves to various locations and touching objects other than dental treatment instruments, 43% of students not wearing masks properly, some even not wearing them at all while treating patients, and all students (100%) failing to use protective eyewear during treatment procedures. Dental health students are part of the healthcare workforce vulnerable to exposure to infectious diseases. Therefore, they must be equipped with adequate knowledge regarding proper PPE usage procedures to protect themselves and their patients. Improper or incorrect use of PPE can have negative impacts on their health and safety (Pradnyandari, Sanjaya, & Purnawan, 2020).

Knowledge is the result of cognitive processes that occur after an individual acquires information through the senses, such as sight, hearing, smell, touch, and taste (Haryani, Astuti, & Minardo, 2021; Riyanti & Emelia, 2021). In the healthcare context, PPE is mandatory equipment used according to potential hazards and occupational risks to ensure the safety of healthcare workers and others in the workplace. The use of PPE in dental treatment includes gloves, masks, protective eyewear, and protective clothing.

Adequate knowledge of PPE is expected to improve students' compliance in its use. Compliance reflects behavioral changes that occur in response to group pressure or specific demands. In this context, students' adherence to PPE usage is crucial to ensuring both patient safety and their own safety during clinical practice in dental healthcare facilities. This study aims to analyze the relationship between students' knowledge levels and their compliance with PPE usage.

RESEARCH METHODS

This study is an analytical observational research with a cross-sectional design. The population in this study consists of all fifth-semester students undergoing practical training in dental and oral healthcare services at the Dental Health Department laboratory, with a total of 97 students. The sampling technique used was total sampling, meaning the entire population was included as research participants.

The study was conducted in two main stages: the preparation stage and the implementation stage. During the preparation stage, research instruments were developed in the form of a questionnaire to measure students' knowledge and compliance in using personal protective equipment (PPE). The questionnaire was designed using an ordinal scale. To support the questionnaire results and gain a deeper understanding of respondents' knowledge

about PPE, interviews were conducted with six respondents (10% of the total sample), using five structured questions.

Data analysis was carried out using descriptive analysis to describe the characteristics of the research variables. Furthermore, Kendall's Tau-b correlation test was used to analyze the relationship between students' knowledge levels and their compliance with PPE usage.

This study has also received ethical approval from the Ethics Committee of the Health Polytechnic of the Ministry of Health Kupang, with approval number: No.LB.02.03/1/0067/2024.

RESULTS

Table 1. Frequency distribution of respondents' knowledge level about personal protective equipment.

Respondents' Knowledge Level	Frequency (n)	Percentage (%)
Good	51	52,6
Enough	29	29,9
Less	17	17,5
Total	97	100

Table 1 shows that as many as 51 people from the total respondents, have a good level of knowledge with a percentage of 52.6%.

Table 2. Cross tabulation between gender of respondents and level of knowledge about personal protective equipment.

Gender of Respondents	Level of Knowledge about Personal Protective Equipment						Total	
	Good		Enough		Less		n	%
	n	%	n	%	n	%		
Male	15	15,5	7	7,2	7	7,2	29	29,9
Female	36	37,1	22	22,7	10	10,3	68	70,1
Total	51	52,6	29	29,9	17	17,5	97	100

Table 2 shows that of the 51 respondents who have good knowledge, 36 are female, for a percentage of 37.1%.

Table 3. Frequency distribution of respondents' compliance in carrying out procedures for using personal protective equipment

Compliance Level	Frequency (n)	Percentage (%)
Compliant	68	70,1
Non-compliant	29	29,9
Total	97	100

Table 3 shows the frequency distribution data of respondents' compliance in carrying out procedures for using personal protective equipment, the results showed that 70.1% of the total 97 respondents, namely 68 people were compliant with the procedure for using personal protective equipment.

Table 4. Cross tabulation between the type of gender of respondents with compliance in carrying out procedures for using personal protective equipment.

Gender of Respondents	Compliance in Performing Procedures for the Use of Personal Protective Equipment				Total	
	Compliant		Non-compliant		n	%
	n	%	n	%		
Male	14	14,4	15	15,5	29	29,9
Female	54	55,7	14	14,4	68	70,1
Total	68	70,1	29	29,9	97	100

Table 4 shows that of the 68 compliant respondents, 54 were female.

Table 5. Cross-tabulation between the level of knowledge and respondents' compliance in carrying out procedures for using personal protective equipment.

Respondents' Knowledge Level	Respondents' Compliance in Performing Procedures for the Use of Personal Protective Equipment				Total	
	Compliant		Non-Compliant		n	%
	n	%	n	%		
Good	37	38,1	14	14,4	51	52,6
Enough	28	28,9	1	1,0	29	29,9
Less	3	3,1	14	14,4	17	17,5
	68	70,1	29	29,9	97	100

Table 5 shows that the level of knowledge with compliance in carrying out procedures for the use of personal protective equipment is out of a total of 51 respondents with good knowledge, 37 of them are compliant with a percentage of 38.1%.

Table 6. Kendall's tau_b Correlation Test Results.

Kendall's tau_b Correlations		Knowledge Category	Adherence Category
Knowledge Category	Correlation Coefficient	1.000	.216*
	Sig. (2-tailed)	.	.027
	N	97	97
Adherence Category	Correlation Coefficient	.216*	1.000
	Sig. (2-tailed)	.027	.
	N	97	97

*. Correlation is significant at the 0.05 level (2-tailed).

Table 6 shows the significant Kendall's tau_b correlation test result of 0.027 with a significant value of less than 5% ($p = 0.027 < 0, 05$), so H_0 is rejected H_a is accepted. This analysis data shows a strong relationship between the level of knowledge and student compliance in carrying out procedures for using personal protective equipment at the Kupang Dental Health Department.

DISCUSSION

The study results indicate that 52.6% of respondents have a good level of knowledge about personal protective equipment (PPE), while the remaining respondents have a moderate (29.9%) or low (17.5%) level of knowledge. Although more than half of the respondents fall into the high knowledge category, the primary factor influencing this level of knowledge is personal motivation to seek additional information, either through self-study or further exploration of materials obtained from lectures. The lack of information updates and limited training on PPE according to standard operating procedures (SOPs) also contribute to the low level of student knowledge. This finding aligns with the study by Cahyani et al., (2024), which states that PPE training is essential for healthcare students to improve compliance and prevent cross-infection. Similarly, Herawati, (2017) found that both formal and informal education, such as training and counseling, can enhance healthcare workers' knowledge in protecting themselves from infection risks.

Regarding gender differences, the majority of respondents with good knowledge levels were female (37.1%). This result is supported by the study of Briantono & Achmad, (2020), which states that men tend to prioritize competition and often disregard rules compared to women, who are more meticulous and disciplined in carrying out tasks. However, there is no scientific evidence explicitly stating that differences in knowledge levels between males and females are due to biological or cognitive factors, (Suwaryo & Yuwono, 2017).

In terms of compliance, the study results show that 55.7% of students who adhered to PPE usage were female. Several studies support this finding, such as the study by Veriza &

Junaidi, (2017), which states that women generally have a higher level of compliance than men. However, Apriluana, (2016) found no significant relationship between gender and compliance. Compliance itself results from the internalization of values related to discipline and order rather than simply a biological factor (Niven, 2012).

Observational findings revealed that none of the respondents used protective goggles or protective clothing (0%). This finding was reinforced by interview results, which revealed that PPE facilities, particularly goggles and protective clothing, were unavailable in the practice laboratory. This is consistent with the study by Herawati et al., (2017), which states that although healthcare workers may have high knowledge of PPE, they cannot use it optimally if adequate facilities are unavailable. Therefore, infection prevention and control should be a shared responsibility between healthcare service institutions and dental healthcare professionals.

The analysis of the relationship between knowledge level and compliance showed that 38.1% of respondents with good knowledge levels exhibited compliance with PPE procedures, while 28.9% of respondents with moderate knowledge levels were also considered compliant. Interestingly, three respondents with low knowledge levels still demonstrated compliance in PPE usage. This finding supports the hypothesis that the higher a person's knowledge level, the greater the likelihood of adherence to PPE procedures. Arbianti, (2019) also concluded that knowledge is a predisposing factor in shaping human behavior, meaning individuals with higher knowledge levels tend to have better compliance with PPE usage.

This study is further supported by observational findings using a checklist, which showed that most respondents adhered to PPE procedures. This finding aligns with Prasetyowati (2015), who stated that compliance is behavior that follows rules and discipline. An individual is considered compliant if they consistently use PPE during patient care following established SOPs. Additionally, Mardiana, (2017) found that individuals with better knowledge are more likely to adhere to SOPs than those with lower knowledge levels.

CONCLUSION

In conclusion, higher knowledge levels about PPE are associated with greater compliance among students. Therefore, more intensive training and socialization efforts are needed to enhance students' adherence to PPE implementation.

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