



The Correlation Of Standard Precautions Knowledge Level With Covid-19 Cases That Have Occurred In Dental And Oral Therapists

Agnes Lia Renata^{1✉}, Muti'ah Suharyono², Furaida Khasanah³

¹⁻³ Poltekkes Kemenkes Yogyakarta, Indonesia

✉ agnesliarenata@gmail.com, Phone: : +6281225106580

Received: 19 February 2023/Accepted:23 May 2023/Published Online: 21 August 2023

© This Journal is an open-access under the CC-BY-SA License

Abstract

COVID-19 cases continue to spread in every level of society, including dental and oral therapists. The dental and oral therapist's work zone that is in contact with droplets and saliva is the transmission of COVID-19 transmission. Prevention of transmission of COVID-19 to dental and oral therapists is carried out through the application of standard precaution which is influenced by the level of knowledge of each individual. Lack of knowledge causes a person to have poor standard precaution applications. To determine the relationship between the level of knowledge of standard precaution with the application of standard precaution to dental and oral therapists in preventing the transmission of the COVID-19 virus. This research is an analytic survey with a cross sectional design. The study was carried out in January-February 2022. Sampling using proportionate stratified random sampling technique with a sample of 130 people. Data analysis using Kendall's tau. The results showed a p-value of 0.00 ($p < 0.005$). Test (t) = 0.419. Most of the respondents have a moderate level of knowledge (38.5%), while the level of application of standard precaution is mostly in good criteria (66.9%). The level of knowledge of standard precaution is related to the application of standard precaution of dental and oral therapists in preventing the transmission of the COVID-19 virus with a fairly strong positive correlation.

Keywords : Knowledge; Standard Precaution; Dental and Oral Therapist; COVID-19

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a disease caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) (Ge et al., 2020). The spread of this virus can be transmitted to someone in close contact of less than one meter through saliva splashes or droplets released through sneezing, coughing, aerosols, or air by people with COVID-19 (Al-Amri et al., 2019). Covid-19 has symptoms such as fever, dry cough, dyspnea and which may progress to pneumonia (Reda & Ahmed, 2020; Sim, Kim, & Noh, 2022; Sudarmi, Rohani, Irianto, & Anggraeni, 2022). Transmission through items that are splashed with the

patient's saliva can transmit this virus (Nugroho et al., 2020).

The increase in positive cases of COVID-19 in various countries in the world, made WHO raise the status of COVID-19 globally to a pandemic on March 12, 2020 (Pitanatri, Made, & Kencanawati, 2021; Sim et al., 2022). Since March 14, 2020, Indonesia has declared COVID-19 a national disaster. COVID-19 attacks all levels of society, including health workers in the field of oral health. Healthcare workers are at greater risk of exposure to infectious agents through direct contact with patients or through improper handling as part of their work (Afolaranmi et al., 2019).

Data from the Indonesian Dental Association, as many as 39 dentists died from exposure to COVID-19. Data as of February 5, 2021, there were 396 dentists exposed to COVID-19 (PDGI, 2021). In July 2021, data collected from LaporCovid (2021) recorded that 46 dentists and 3 dental therapists were recorded to have died from COVID-19. Health workers should be prepared to conduct contact tracing of high cases to reduce transmission (Sarkar, Sarkar, & Sengupta, 2017).

The COVID-19 widespread has had repercussions on dental care, due to the chance of cross-contamination in dental clinics due to the characteristics of dental methods, amid which mist concentrates are produced, and due to the nearness of the proficient to the persistent (Rodríguez-Fernández, Vázquez-Cancela, Piñeiro-Lamas, Figueiras, & Zapata-Cachafeiro, 2022). The era of constant contact with mist concentrates, beads and saliva, and the fact that the oral cavity is already a multi-microbial environment, greatly increases the risk of contracting SARS-CoV-2 (Cruz-Fierro, Borges-Yáñez, Duarte, Cordell, & Rodriguez-Garcia, 2022).

The work zone of dental and oral therapists who produce aerosols and come into direct contact with saliva, blood, and mucosal tissue in the patient's mouth in dental health services can trigger the transmission of the COVID-19 virus (Damayanti, 2016). The risk of transmission in outpatient clinics such as dental clinics will be different from general wards, emergency rooms or intensive care units due to differences in duration of contact, use of standard precaution (SP) and aerosol procedures (Chung, Kim, Kim, & Jung, 2020). So it is necessary to apply SPs, namely carrying out vaccinations, hand hygiene and the use of personal protective equipment (PPE) (Tim Kerja Kementerian Dalam Negeri, 2013). Factors associated with the use of PPE are the level of knowledge, attitudes,

availability, and policies on the use of PPE (Ningsih, Naiem, & Awaluddin, 2018).

The ability of hospitals to safely treat COVID-19 patients who require during and after the pandemic while maintaining other critical health services is critical to the health of patients and hospital staff (Żóttowska et al., 2021). Patient safety means avoiding avoidable errors and accidents in the medical process and avoiding or reducing patient injury (Lim, Ahn, & Son, 2019). Secondary measures to prevent Covid-19 transmission require the addition of non-invasive equipment (Rooney, McIntyre, Ritchie, & Wilcox, 2021). Authoritative control such as persistent screening, moving towards an arrangement framework, and physical removing measures were empowered (Amnuaiphanit, Thumbuntu, Gaewkhiew, & Ampornaramveth, 2022).

Based on the results of a preliminary study conducted by researchers in September on 10 dental and oral therapists conducted by providing a number of questions based on questionnaires and interviews. The results of the preliminary study were obtained by respondents with a moderate level of knowledge and had poor criteria as many as 30% of respondents, while respondents with a low level of knowledge and had poor criteria as many as 40% of respondents.

In previous studies, research has been conducted on the relationship between knowledge, attitudes and actions with the use of PPE in health workers (Afandi, Handayani, & Zaini, 2021; Zeb & Ali, 2021). The application of SP during a pandemic is not only limited to the use of PPE, but also the application of hand hygiene and vaccination. Hand hygiene is an important part of SP and one of the most effective ways to prevent nosocomial transmission (Ankita & Ipsa, 2021; World Health Organization, 2020). The utilize of standard safety measures is suggested for all patients, notwithstanding of suspected or affirmed contamination status (Beyamo, Dodicho, & Facha,

2019). Therefore, research is needed regarding the relationship between the level of knowledge of SP and the application of SP during a pandemic as a form of prevention of transmission of the COVID-19 virus in dental and oral therapists.

METHOD

The type of research conducted used an analytical survey approach with a cross sectional design. The population of this study were members of the dental and oral therapists with a sample size of 130 respondents from 192 dental and oral therapist. Sampling using proportionate stratified random sampling technique with inclusion criteria are dental and oral therapists who have a DIII or DIV educational background, DPC PTGMI Sleman members, work in private hospitals/health center/clinics, are not on leave/not working during data collection. The exclusion criteria for this study are dental and oral therapists with SPRG background, are pursuing further education, are not members of the DPC PTGMI Sleman, are on leave from work.

The independent variable is knowledge about SP which is measured using a questionnaire consisting of 14 closed questions with multiple choice answers. The results of measuring knowledge are high if the correct score is > 75%, moderate knowledge if 56% < correct score < 75% and low knowledge if the score is < 55%. The dependent variable is action in the application of SP measured using a questionnaire consisting of 11 questions with answer options using a linkert scale. The measurement results were categorized as good if the score was > 75% and poor action if the score was < 75%. The data obtained were analyzed using the Kendall's tau test to determine the relationship between the level of knowledge of SP and the application of SP. The questionnaires used have been tested for validity and reliability which has been tested for validity with Correlate Product Moment and

reliability test with Cronbach Alpha test. Based on the validity test, a calculated r value of 0.644 for the self-protection knowledge questionnaire and 0.082 for the self-protection application questionnaire ($r_{count} > r_{table}$). While the value of the reliability test results is 0.700 for the knowledge questionnaire and 0.729 for the self-protection application questionnaire. The instrument is declared reliable if the value of Cronbach's Alpha > 0.060 (Purwanto, 2018).

Measurement of Covid-19 Cases using questionnaires related to respondents' experiences whether or not respondent has been exposed to Covid-19. Meanwhile, the measurement of respondents' characteristics was measured using a questionnaire containing demographic data on respondents, namely initials, age, gender, length of service, place of work and education background.

This research has received approval from the Poltekkes Ethics Commission of the Ministry of Health Yogyakarta No. e-KEPK/POLKESYO/0148/I/2022. Before the dental and oral therapist becomes a respondent, an explanation of the research is first given and the existence of informed consent as the respondent's consent follows the study.

RESULT AND DISCUSSION

RESULT

1. Respondent Characteristics

Variable	Frequency	Persentase
Gender		
Male	8	6.2%
Female	122	93.8%
Age		
20-29	30	23.1%
30-39	44	33.8%
40-49	30	23.1%
≥ 50	26	20.0%
Educational Background		
DIII Dental Nurse	94	72.3%
DIV Dental Nurse	36	27.7%
Duration of Employment		
< 5 years	30	23.1%
5-10 years	25	19.2%

11-15 years	24	18.5%
> 15 years	51	39.2%
Level of Knowledge		
High	42	32.3%
Intermediate	50	38.5%
Less	38	29.2%
Application of Self Protection		
Good	87	66.9%
Less good	43	33.1%

Table 1 shows that out of 130 respondents, the most respondents were female as many as 122 respondents (93.8%). In age characteristics, the most respondents were respondents aged 30-39 years as many as 44 respondents (33.8%). The largest frequency distribution on the last education level criteria was at DIII Dental Nursing as many as 94 respondents (72.3%). The most respondents on the criteria for length of work were respondents who had worked for more than 15 years as many as 51 respondents (39.2%). The largest distribution based on the characteristics of the level of standard precaution knowledge is the moderate level of knowledge as many as 50 respondents (38.5%) and the respondents with the least level of SP knowledge are the criteria for low knowledge level as many as 38 respondents (29.2%). Meanwhile, based on the characteristics of the application of SP, the most respondents were found in the criteria for implementing good SP as many as 87 respondents (66.9%).

2. Cross Tabulation Result

a. Cross tabulation based on characteristics with level of standard precaution knowledge

Table 2 Cross Tabulation Between Standard precaution Knowledge Level and Respondent Characteristics

Characteristic	Tingkat Pengetahuan						Total N
	High		Intermediate		Less		
	n	%	n	%	n	%	
Gender							
Male	1	0.8	3	2.3	4	3.1	8
Female	41	31.5	47	36.2	34	26.2	122
Age							
20-29	9	6.9	16	12.3	5	3.8	30

30-39	17	13.1	14	10.8	13	10.0	44	33.8
40-49	11	8.5	11	8.5	8	6.2	30	23.1
> 50	5	3.8	9	6.9	12	9.2	26	20.0

Educational Background

DIII Dental Nurse	29	22.3	39	30.0	26	14.6	85	72.3
DIV Dental Nurse	13	10.0	11	8.5	12	9.2	36	27.7

Duration of Employment

< 5 years	8	6.2	13	10.0	9	6.9	30	23.1
5 -10 years	11	8.5	9	6.9	5	3.8	25	19.2
11-15 years	7	5.4	10	7.7	7	5.4	24	18.5
> 15 years	16	12.3	18	13.8	17	13.1	51	39.2

Table 2 shows that most female respondents have SP knowledge with high knowledge level criteria as many as 47 respondents (36.2%). The highest frequency based on the age of the respondents was obtained in respondents aged 30-39 years who had high SP knowledge as many as 17 respondents (13.1%). Based on the latest education, it shows that most respondents with the latest education level DIII Dental Nursing have SP knowledge with moderate criteria as many as 39 respondents (30.0%). While most respondents who worked for more than 15 years had moderate SP knowledge as many as 18 respondents (13.8%).

b. Cross tabulation based on respondent characteristics with the application of standard precaution

Table 3 Cross Tabulation Between Application of Standard precaution with Respondent Characteristics

Characteristic	Application of Standard precaution				Total	
	Good		Less Good		N	%
	n	%	n	%		
Gender						
Male	6	4.6	2	1.5	8	6.2
Female	81	62.3	41	31.5	122	93.8
Age						
20-29	24	18.5	6	4.6	30	23.1
30-39	25	19.2	19	14.6	44	33.8
40-49	19	14.6	11	8.5	30	23.1
> 50	19	14.6	7	5.4	26	20.0

Educational Background

DIII Nurse	Dental	60	46.2	34	26.2	94	72.3
DIV Nurse	Dental	27	20.8	9	6.9	36	27.7

Duration of Employment

> 5 years	21	16.2	9	6.9	30	23.1
5-10 years	16	12.3	9	6.9	25	19.2
11-15 years	14	10.8	10	7.7	24	18.5
> 15 years	36	27.7	15	11.5	51	39

Table 3 shows that most female respondents have good SP implementation as many as 81 respondents (62.3%). Based on age criteria, most respondents aged 30-39 years had good SP implementation as many as 25 respondents (19.2%). The highest frequency distribution based on the last level of education showed that respondents with the last level of education DIII Dental Nursing had the application of SP with good criteria as many as 60 respondents (46.2%). In addition, most respondents who worked for more than 15 years had good SP as many as 36 respondents (27.7%).

3. Relationship between Completeness of Personal Protective Equipment and Knowledge Level of Dental and Oral Therapists

The results of data management of the variable level of SP knowledge with the application of SP obtained from the Kendall Tau test results can be seen in the cross tabulation table as follows:

Table 4 Cross Tabulation Between Level of Knowledge of Standard Precaution and Application of Standard Precaution

No	Level of Knowledge	Application of Standard Precaution				Total	
		Good		Less Good		N	%
		n	%	n	%		
1.	High	38	29.2	4	3.1	42	32.3
2.	Intermediate	34	26.2	16	12.3	50	38.5
3.	Less	15	11.5	23	17.7	38	29.2
	Total	87	66.9	43	33.1	130	100

Table 4 above shows that most respondents have a high level of education with good SP implementation criteria, namely 38 respondents (29.2%).

Table 5 Kendall Tau Test Results Relationship between Standard Precaution Knowledge Level and Standard Precaution Implementation

N	P	A
130	0,00	0,05

Table 5 above, shows the results of the Kendall's Tau test regarding the relationship between SP knowledge and the application of SP in dental and oral therapy, the test result (T) 0.419, (p) 0.00 < 0.05 which means Ha is accepted Ho is rejected. This can be interpreted that there is a relationship between the level of knowledge of SP and the application of SP for members of dental and oral therapists.

Table 6 Tabulation Results of Knowledge Level and Application of Standard Precaution with COVID-19 Cases

Level of Knowledge	Application of Standard Precaution				Total						
	Good		Less Good		n	%					
	Yes	No	Yes	No							
High	3	2.31	35	26.92	2	1.5	4	2	4	42	32.31
Intermediate	3	2.31	31	23.85	4	3.0	8	12	3	50	38.46
Less	0	0.00	15	11.54	5	3.8	5	18	85	38	29.23
Total	6	4.62	81	62.31	11	8.4	6	32	62	0	100

Table 6 shows that dental and oral therapists who have a low level of knowledge and good implementation of SP are still exposed to COVID-19 as many as 5 respondents (3.85%).

DISCUSSION

This research was conducted on 130 respondents of DPC PTGMI Sleman Regency members. Based on Table 1, the gender characteristics of the respondents were mostly female. This is because most members of the Sleman Regency PTGMI DPC are

women. In line with previous research which shows that the health sector is still dominated by women (Balbeid, Rachmi, & Alamsyah, 2018). The characteristics of respondents based on the age of the respondents are mostly aged 30-39 years, which shows that respondents are at a productive working age. The level of education of the respondents was mostly at the DIII dental nursing education level. This shows that most respondents have a good level of education. Someone who has a higher level of education, gets more information about SP. Characteristics based on length of work show that most respondents are oral therapists who actively work in various agencies in the field of oral health after graduating from dental nursing education.

The majority of respondents had a moderate level of knowledge, namely 50 respondents (38.5%). The results of this study can be said that most respondents have a fairly high knowledge of SP. This is in line with previous research which shows that health workers' knowledge of SP tends to be good (Afandi et al., 2021; Arbianti & Hanirizqy, 2019; Rukmana, Putri, & Novariana, 2020). In addition, the application of SP of most respondents is good criteria as many as 87 respondents (66.9%). The results of this study indicate that most respondents have a good application of SP and have used PPE in accordance with the procedures set by their respective agencies and professional organizations for dental and oral therapy. However, there are still respondents who pay less attention to the application of SP. This shows that there are still health workers who do not apply SP properly (Ardini, 2018; Ningsih et al., 2018).

Table 2 based on gender characteristics shows that the comparison of knowledge categorization of each gender is not too different. In line with other studies which state that there is no significant relationship between gender and the level of knowledge

possessed by health workers (Pradana, Widiyati, & Arwani, 2020).

The highest level of knowledge based on the age characteristics of respondents was in respondents aged 30-39 years who had a high level of knowledge as many as 17 respondents (13.1%). Age can affect a person's physical, mental state, willpower and responsibilities. In the early adult stage, individuals are at the stage of excellent cognitive abilities. At this age a person will be easier to learn, do logical reasoning, think creatively and there has not been a deterioration in health. This is in line with other studies that show that respondents' age has an influence on a person's cognitive level (Rachman et al. 2020; Suwaryo and Yuwono 2017). The older a person is, the level of maturity in work and thinking will increase, so it will affect a person's cognitive abilities.

Based on the last level of education, the distribution of knowledge levels was mostly at a moderate level of knowledge with the last level of education DIII Dental Nursing. Whereas in the last education DIV Dental Nursing, the most distribution was at a high level of knowledge. This shows that the higher a person's education, the easier it is for a person to receive information and the wider his knowledge. In line with other studies that show a relationship between level of education and knowledge (Ardini, 2018; Dharmawati & Wirata, 2016; Suwaryo & Yuwono, 2017). Based on the Decree of the Minister of Health Number HK.01.07 / Menkes / 671/2020, there are several differences in the level of ability in DIII with DIV. In the competence of the use of personal protective equipment, the skill level of both DIII and DIV is at the same level of ability, but in the competence of material utilization in dental and oral health, the level of DIV ability is higher than that of DIII (Kementerian Kesehatan RI, 2020).

The largest distribution of respondents based on length of work is in the criteria for moderate knowledge

with a length of work of more than 15 years, namely 18 respondents (13.8%). This shows that the longer a person works, the more experience and the higher the knowledge. In line with other studies that show a relationship between a person's length of service and the knowledge he has (Alta, Widjasena, & Wahyuni, 2020; Liambo, Yasnani, & Munandar, 2017; Rinawati, Widowati, & Rosanti, 2016).

Table 3 shows that female and male respondents have a higher percentage of good SP implementation criteria than criteria. This shows that there is no influence between gender and one's actions towards the application of SP, because in both gender categories, the criteria for applying good SP are higher than the criteria for not good enough. The results of this study are in line with previous research which states that there is no significant relationship between gender and the implementation of PPE use (Pasaribu, 2021; Rahmah, 2012). Both males and females have the same SP measures at work.

Based on the age of the respondents, the highest frequency distribution was among respondents aged 30-39 years who had good SP implementation criteria. The results of this study indicate that adults (30-39 years old) are better at applying the information obtained about better SP. In line with other studies that there is a relationship between age and the application of information that a person has (Dewi, Adawiyah, & Rujito, 2019; Rachman et al., 2020). However, it is not in line with other studies that show there is no significant relationship between age and infection prevention measures at work due to other factors such as individual motivation to take good actions (Pasaribu, 2021).

Based on the latest education obtained DIII Dental Nursing and DIV Dental Nursing have a greater distribution of good protection implementation criteria than poor SP implementation. This shows that between DIII and DIV education there is no significant

difference in the application of SP due to other influencing factors. This is in line with other studies which state that education has no relationship with actions in the community (Rachman et al., 2020).

The results of the cross tabulation between length of work with the application of SP obtained the most data are in respondents with a length of work of more than 15 years having good SP application criteria as many as 36 respondents (27.7%). This shows that the longer a person works, the better the application of SP. The results of this study are in line with other studies and state that there is a relationship between tenure and the application of SP (Utami, Fauzan, & Rahman, 2020).

Table 4 shows that respondents who have a high level of knowledge with good criteria are 50 respondents (29.2%) Based on this table, the percentage of high levels of SP knowledge tends to have good protection implementation, while the percentage of low levels of SP knowledge tends to have poor SP implementation.

The correlation test conducted in this study, as can be seen in Table 16, shows the significance of $0.00 < 0.05$. This shows that H_0 is rejected and H_1 is accepted, so it can be stated that there is a relationship between the level of knowledge about SP and the action of applying SP to members of dental and oral therapists. The correlation coefficient between the two variables is 0.419, which shows a positive correlation and is quite strong (Sugiyono, 2020). This means that the higher the level of knowledge of SP, the better the application of SP in dental and oral therapists and vice versa. Information is the knowledge that creates from not knowing to knowing as a result of instruction and involvement (Fazria & Dhamanti, 2022). This study is in line with previous research which states that there is a relationship between the level of knowledge and the application of SP in health workers (Afandi et al., 2021;

Arbianti & Hanirizqy, 2019; Rukmana et al., 2020; Widyaningsih, 2012).

Knowledge can be obtained through formal education and informal education such as counseling, training, experience and other information. A low level of knowledge can be influenced by several factors such as lack of training, experience, or information (Arbianti & Hanirizqy, 2019). The level of knowledge is also supported by a person's level of education (Mujiburrahman, Riyadi, & Ningsih, 2020). The higher the level of education, the easier it is to get access to information about a problem.

Adherence to PPE is essential to quality of care, and fundamental to prevent the spread of blood-borne, healthcare-associated infections, securing healthcare-associated diseases and patients (Bekele, Ashenaf, Ermias, & Sadore, 2020; Kim & Lee, 2021; Wong et al., 2021). Standard precaution may be summarized as hand cleanliness, appropriate PPE utilize, mindfulness of the potential for pressurized canned products being breathed out by patients, sharps security, and appropriate cleaning and sanitizing of natural surfaces (Richey, Fowler, Swienton, O'Neal, & Harris, 2021). In the results of this study, respondents' knowledge about SP affects the application of SP at work during the Covid-19 pandemic, in other words, knowledge is an important factor in shaping a person's actions. In line with other studies which state that good knowledge will tend to cause a better level of compliance and use of PPE (Arbianti & Hanirizqy, 2019; Marlina, Syam, & Bahtiar, 2021). However, there are other studies that are not in line with this study which state that there is no significant relationship between the level of knowledge and the application of SP in health workers (Putra, 2012; Rachman et al., 2020). This is due to other factors besides knowledge that can influence the implementation of SP.

The application of personal protection is an effort to avoid exposure to hazardous risks in the

workplace (Jubayer Biswas et al., 2021). During the COVID-19 pandemic, the application of personal protection is one of the efforts to prevent transmission of COVID-19. In Table 16 there are respondents who have high knowledge but the application of SP is still not good and there are 15 respondents with low knowledge but have good SP application criteria. This shows that there are still other factors that influence the actions of a person. In this study, several characteristics were obtained that also influence a person's actions such as age, education level and length of employment. Predisposing factors, supporting factors and reinforcing factors that influence a person's actions include attitude, education level, supervision and availability of facilities (Pasaribu, 2021; Widyaningsih, 2012). So that good knowledge can not automatically make an individual have good actions.

High knowledge with good implementation of SP does not rule out the possibility of COVID-19 transmission cases in dental and oral therapists. Until March 2022, data obtained as many as 18 dental and oral therapists in Sleman Regency were exposed to COVID-19. This can be caused by various factors such as the availability of PPE, psychological and physical fatigue.

Psychological exhaustion is related to the management of stress or burnout of dental and oral therapists in their work. Factors causing this stress include fear of being infected with COVID-19, workload, and the negative stigma of virus carriers. There are various factors that can cause stress for health workers during a pandemic, including opportunity factors, constraint factors, demand factors, workload, negative perception factors about COVID-19, lack of work experience factors, worry factors about COVID-19, social support factors, fear factors, negative stigma factors, supporting facilities factors, patient emotional demands, emotional intelligence factors, sleep quality (Sembiring, Rahman, & Tasalim, 2022).

Based on the results of analyzing respondents' answers regarding the reasons for the lack of attention to the use of PPE, respondents with information did not use PPE appropriately due to feelings of discomfort, inefficiency and the use of PPE that adjusted conditions. Perception can be a factor in preventing transmission of COVID-19 cases. Individuals who have high sensitivity are able to deal with COVID-19 countermeasures more quickly, while indifferent individuals pay less attention to overcoming COVID-19 quickly. In line with other studies which state that there are differences in perceptions of health workers in overcoming COVID-19 (Mustika & Gani, 2022).

Physical fatigue can cause a decrease in a person's resistance to disease. The workload borne by dental and oral therapists in handling patients is one of the factors of physical fatigue experienced. A person who is exhausted will reduce his body's resistance and be more susceptible to disease. Work fatigue is one of the causes of work accidents (Bunga, Amirudin, Situngkir, & Wahidin, 2021).

Human errors that occur during the use and removal of PPE are another trigger factor that can cause COVID-19 cases to still exist in dental and oral therapists. Human errors found in this study include lack of accuracy in the use of PPE, repeated use of handsoons with different patients without realizing it, rushed use and removal of PPE, incomplete use of PPE and improper application of hand hygiene. The unavailability of PPE in large quantities and leaks in the use of PPE are gaps in the transmission of COVID-19 to dental and oral therapists. The use of inappropriate PPE has a higher risk of contracting the disease (Sa'adah, 2017).

CONCLUSION

The results of research data analysis and discussion can be concluded that the level of knowledge about SP is mostly included in the level of

moderate knowledge. The criteria for the application of SP of dental and oral therapists are included in the good criteria. The results of hypothesis testing can be concluded that there is a fairly strong relationship between the level of knowledge of SP and the application of SP.

To prevent disease transmission both from patients to health workers and vice versa, a program to increase the knowledge and skills of health workers related to cross-infection control is needed. So that there is an update on the knowledge possessed by dental and oral therapists.

REFERENCES

- Afandi, A., Handayani, L. T., & Zaini, M. (2021). Hubungan Pengetahuan dan Sikap Tenaga Kesehatan dengan Perilaku Penggunaan Alat Pelindung Diri di Masa Pandemi Covid-19 di RSD Balung.
- Afolaranmi, T. O., Hassan, Z. I., Pam, O. S., Ugwu, L. M., Oyegoke, T. I., Bello, K. K., ... Ogbeyi, G. O. (2019). Assessment of Safe Handling Practices among Resident Doctors in Jos University Teaching Hospital Plateau state, Nigeria. *Journal of Medicine in the Tropics*, 19, 116–122. <https://doi.org/10.4103/jomt.jomt>
- Al-Amri, S., Bharti, R., Alsaleem, S. A., Al-Musa, H. M., Chaudhary, S., & Al-Shaikh, A. A. (2019). Knowledge and Practices of Primary Health Care Physicians Regarding Updated Guidelines of MERS-CoV Infection in Abha city. *Journal of Family Medicine and Primary Care*, 8(2), 169–170. https://doi.org/https://doi.org/10.4103/jfmpc.jfmpc_336_18
- Alta, S., Widjasena, B., & Wahyuni, I. (2020). Studi Literatur Terkait Analisis Perilaku Kepatuhan Penggunaan Alat Pelindung Diri (APD) Pada Tenaga Kesehatan saat Wabah Pandemi Corona Virus (COvid-19). *Jurnal Ilmiah Mahasiswa*, 10(4), 105–110. Retrieved from <https://ejournal.undip.ac.id/index.php/jim/article/view/35111>
- Annuaiphanit, P., Thumbuntu, T., Gaewkhiew, P., & Ampornaramveth, R. S. (2022). Paradigm Shift in Infection Control Practices in Dental Clinics in Response to COVID-19 among Dental Professionals in Thailand. *Frontiers in Oral Health*, 3(September), 1–12. <https://doi.org/10.3389/froh.2022.979600>
- Ankita, B., & Ipsa, M. (2021). First Year Medical Students' and Standard Precautions: The Need for

- Change. *Clinical Epidemiology and Global Health*, 9(July 2020), 221–226. <https://doi.org/10.1016/j.cegh.2020.09.002>
- Arbianti, K., & Hanirizqy, M. (2019). Hubungan Pengetahuan Dokter Gigi Terhadap Penggunaan Alat Pelindung Diri (APD) di Rumah Sakit Islam Gigi dan Mulut Sultan Agung Semarang. *ODONTO Dental Journal*, 6, 1–7. <https://doi.org/10.30659/odj.6.0.1-7>
- Ar dini, Si. (2018). *Gambaran Penggunaan Alat Pelindung Diri (APD) pada Petugas Instalasi Sanitasi dan K3 di Rumah Sakit Umum Haji Medan Tahun 2018*. Universitas Sumatera Utara. Retrieved from <http://repositori.usu.ac.id/bitstream/handle/123456789/5850/141000605.pdf?sequence=1&isAllowed=y>
- Balbeid, M., Rachmi, A. T., & Alamsyah, A. (2018). Pengaruh Pengetahuan dan Sikap Dokter dan Perawat terhadap Kesiapan Berubah dalam Menerapkan Clinical Pathway. *E-Prodenta Journal of Dentistry*, 2(1), 98–107. Retrieved from <https://eprodenta.ub.ac.id/index.php/eprodenta/article/view/40>
- Bekele, T., Ashenaf, T., Ermias, A., & Sadore, A. A. (2020). Compliance with Standard Safety Precautions and Associated Factors among Health Care Workers in Hawassa University Comprehensive, Specialized Hospital, Southern Ethiopia. *PLoS ONE*, 15(10 October), 1–11. <https://doi.org/10.1371/journal.pone.0239744>
- Beyamo, A., Dodicho, T., & Facha, W. (2019). Compliance with Standard Precaution Practices and Associated Factors among Health Care Workers in Dawuro Zone, South West Ethiopia, cross sectional study. *BMC Health Services Research*, 19(1), 4–9. <https://doi.org/10.1186/s12913-019-4172-4>
- Bunga, S., Amirudin, H., Situngkir, D., & Wahidin, M. (2021). Faktor yang Mempengaruhi Kelelahan Kerja pada Tenaga Kesehatan Lapangan Dompot Dhuafa pada Masa Pandemi Covid-19. *Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi*, 2, 40–51.
- Chung, H., Kim, E. O., Kim, S. H., & Jung, J. (2020). Risk of COVID-19 Transmission from Infected Outpatients to Healthcare Workers in an Outpatient Clinic. *Journal of Korean Medical Science*, 35(50), e431. <https://doi.org/10.3346/jkms.2020.35.e431>
- Cruz-Fierro, N., Borges-Yáñez, A., Duarte, P. C. T., Cordell, G. A., & Rodriguez-Garcia, A. (2022). COVID-19: The Impact on Oral Health Care. *Ciencia e Saude Coletiva*, 27(8), 3005–3012. <https://doi.org/10.1590/1413-81232022278.03522021>
- Damayanti, F. (2016). *Penerapan Proteksi Diri Dokter Gigi sebagai Upaya Pencegahan Terjadinya Infeksi di Praktik Dokter Gigi Kota Medan Tahun 2016*. Universitas Sumatera Utara Medan. Retrieved from <https://repositori.usu.ac.id/handle/123456789/19203>
- Dewi, I. P., Adawiyah, W. R., & Rujito, L. (2019). Analisis Tingkat Kepatuhan Pemakaian Alat Pelindung Diri Mahasiswa Profesi Dokter Gigi di Rumah Sakit Gigi dan Mulut UNSOED. *Jurnal Ekonomi, Bisnis Dan Akuntansi (JEBA)*, 21(4). <https://doi.org/10.32424/jeba.v21i4.1541>
- Dharmawati, I. G. A. A., & Wirata, I. N. (2016). Hubungan Tingkat Pendidikan, Umur, Dan Masa Kerja Dengan Tingkat Pengetahuan Kesehatan Gigi Dan Mulut Pada Guru Penjaskes Sd Di Kecamatan Tampak Siring Gianyar. *Jurnal Kesehatan Gigi*, 4(1), 1–5. <https://doi.org/10.33992/jkg.v4i1.500>
- Fazria, N. F., & Dhamanti, I. (2022). Knowledge And Attitude Towards Medication Safety: Study From Religion Based Hospital. *Jurnal Kesehatan Prima*, 16(1), 25–33. <https://doi.org/10.32807/jkp.v17i1.1143>
- Ge, H., Wang, X., Yuan, X., Xiao, G., Wang, C., Deng, T., ... Xiao, X. (2020). The Epidemiology and Clinical Information About COVID-19. *European Journal of Clinical Microbiology and Infectious Diseases*, 39(6), 1011–1019. <https://doi.org/10.1007/s10096-020-03874-z>
- Jubayer Biswas, M. A. Al, Hassan, M. Z., Monjur, M. R., Islam, M. S., Rahman, A., Akhtar, Z., ... Homaira, N. (2021). Assessment of Standard Precaution Related to Infection Prevention Readiness of Healthcare Facilities in Bangladesh: Findings from A National Cross-Sectional Survey. *Antimicrobial Stewardship and Healthcare Epidemiology*, 1(1), 1–7. <https://doi.org/10.1017/ash.2021.226>
- Kementerian Kesehatan RI. Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/Menkes/671/2020, 8 Kementerian Kesehatan § (2020). Indonesia. Retrieved from [https://ktki.kemkes.go.id/info/sites/default/files/KMK No. HK.01.07-MENKES-671-2020 ttg Standar Profesi Terapis Gigi dan Mulut.pdf](https://ktki.kemkes.go.id/info/sites/default/files/KMK%20No.%20HK.01.07-MENKES-671-2020%20ttg%20Standar%20Profesi%20Terapis%20Gigi%20dan%20Mulut.pdf)
- Kim, S. J., & Lee, E. J. (2021). Factors Influencing Emergency Department Nurses' Compliance with Standard Precautions Using Multilevel Analysis. *International Journal of Environmental Research and Public Health*, 18(11). <https://doi.org/10.3390/ijerph18116149>
- Liambo, I. S. D., Yasnani, & Munandar, S. (2017). Faktor yang Berhubungan dengan Perilaku Penggunaan Alat Pelindung Diri (APD) Pada Tenaga Teknisi PT PLN (Persero) Wilayah Sulselrabar Sektor Pembangkitan Kendari Unit PLTD Wua-Wua Kota Kendari Tahun 2017. *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, 2(6), 1–9.
- Lim, J. H., Ahn, J. W., & Son, Y. J. (2019). Association between Hospital Nurses' Perception of Patient Safety Management and Standard Precaution

- Adherence: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, 16(23), 1–12. <https://doi.org/10.3390/ijerph16234744>
- Marlina, R., Syam, Y., & Bahtiar, B. (2021). Analisis Kepatuhan Penggunaan Alat Pelindung Diri dalam Pelaksanaan Cegah Tangkal Penyakit Covid-19 di Pintu Negara Pada Petugas Kesehatan Kantor Kesehatan Pelabuhan Kelas I Makassar. *Alauddin Scientific Journal of Nursinf*, 1(2), 113–126. Retrieved from <https://journal.uin-alauddin.ac.id/index.php/asjn/article/view/21585>
- Mujiburrahman, Riyadi, M. E., & Ningsih, M. U. (2020). Pengetahuan Berhubungan dengan Peningkatan Perilaku Pencegahan COVID-19 di Masyarakat. *Jurnal Keperawatan Terpadu*, 2, 130–140. Retrieved from <http://jkt.poltekkes-mataram.ac.id/index.php/home/index%0Ap-ISSN>:
- Mustika, A. A., & Gani, A. (2022). Analisis Persepsi Risiko pada Tenaga Kesehatan di Fasilitas Kesehatan Saat Pandemi Covid-19; A Literature Review. *Jurnal Medika Hutama*, 93, 1745–1757. Retrieved from <http://jurnalmedikahutama.com/index.php/JMH/article/view/367>
- Ningsih, H., Naiem, M. F., & Awaluddin, A. (2018). Faktor yang Berhubungan dengan Penggunaan Alat Pelindung Diri Pada Perawat di Instalasi Rawat Inap RSUD Kabupaten Mamuju Sulawesi Barat Tahun 2018. Universitas Hassanudin. Retrieved from <http://digilib.unhas.ac.id/opac/detail-opac?id=41627>
- Nugroho, W. D., C, W. I., Alanish, S. T., Istiqomah, N., Cahyasari, I., Indrasturi, M., ... Isworo, A. (2020). Jurnal of Bionursing Literature Review : Transmisi Covid-19 dari Manusia ke Manusia Di Asia. *Jurnal of Bionursing*, 2(2), 101–112.
- Pasaribu, H. K. F. (2021). Hubungan Antara Pengetahuan dan Sikap Mengenai Covid-19 dengan Perilaku Pencegahan Infeksi Saat Bekerja pada Tenaga Kesehatan dan Non-Kesehatan di Puskesmas di Zona Merah di Kota Medan dan Kota Batam Selama Pandemi Covid-19. Universitas Sumatera Utara Medan.
- PDGI. (2021). Waspada, Telah 39 Dokter Gigi Meninggal. Retrieved from <pdgi.or.id/artikel/waspada-telah-39-dokter-gigi-meninggal>
- Pitanatri, N. B., Made, N., & Kencanawati, I. (2021). Manifestasi dan Transmisi Okular Pada Coronavirus Disease 2019 (COVID-19): Klinis dan Pencegahan. *Intisari Sains Medis*, 12(1), 313–316. <https://doi.org/10.15562/ism.v12i1.918>
- Pradana, F. R., Widiyati, S., & Arwani. (2020). Hubungan Karakteristik dengan Tingkat Pengetahuan Perawat tentang Tuberculosis (TB) Paru pada Anak. *Jendela Nursing Kournal*, 4(2), 113–121. <https://doi.org/10.31983/jnj.v4i2.4941>
- Purwanto. (2018). *Teknik Penyusunan Instrumen*. (A. Saifudin, Ed.) (1st ed.). Purworejo: StaiaPress.
- Putra, M. U. K. (2012). Hubungan Tingkat Pengetahuan dan Sikap dengan Perilaku Penggunaan Alat Pelindung Diri Pada Mahasiswa Profesi Fakultas Ilmu Keperawatan Universitas Indonesia. Universitas Indonesia. Retrieved from <https://lib.ui.ac.id/detail?id=20301537&lokasi=lokal>
- Rachman, L. A., Yulianto, F. A., Djojogugito, M. A., Andarini, M. Y., & Djajakusumah, T. S. (2020). Hubungan Pengetahuan dan Sikap terhadap Perilaku Penggunaan Alat Pelindung Diri di PT Sarandi Karya Nugraha Sukabumi. *Jurnal Integrasi Kesehatan & Sains*, 2(2), 154–159. <https://doi.org/10.29313/jiks.v2i2.4341>
- Rahmah, D. A. (2012). Pengaruh Pengetahuan terhadap Implementasi Alat Pelindung Diri (APD) pada Pekerja Bagian Spinning PT Tufountex Indonesia Sukoharjo. Universitas Sebelas Maret. Retrieved from <https://digilib.uns.ac.id/dokumen/detail/25688/Pengaruh-Pengetahuan-Terhadap-Implementasi-Alat-Pelindung-Diri-Apd-Pada-Pekerja-Bagian-Spinning-PT-Tyfountex-Indonesia-Sukoharjo>
- Reda, A. M., & Ahmed, W. M. (2020). Standard Precaution Measurements During Ophthalmology Practice in The Pandemic Stage of COVID-19. *International Journal of Ophthalmology*, 13(7), 1017–1022. <https://doi.org/10.18240/ijo.2020.07.01>
- Richey, T. W., Fowler, R. L., Swinton, R. E., O'Neal, J. P., & Harris, C. A. (2021). Review of Emergency Medical Services Vulnerability to High Consequence Infectious Disease in the United States. *Frontiers in Public Health*, 9(October). <https://doi.org/10.3389/fpubh.2021.748373>
- Rinawati, S., Widowati, N. N., & Rosanti, E. (2016). Pengaruh Tingkat Pengetahuan terhadap Pelaksanaan Pemakaian Alat Pelindung Diri sebagai Upaya Pencapaian Zero Accident di PT X. *Journal of Industrial Hygiene and Occupational Health*, 1(1). <https://doi.org/10.21111/jihoh.v1i1.606>
- Rodríguez-Fernández, A., Vázquez-Cancela, O., Piñeiro-Lamas, M., Figueiras, A., & Zapata-Cachafeiro, M. (2022). Impact of the COVID-19 Pandemic on Antibiotic Prescribing by Dentists in Galicia, Spain: A Quasi-Experimental Approach. *Antibiotics*, 11(8), 1–10. <https://doi.org/10.3390/antibiotics11081018>
- Rooney, C. M., McIntyre, J., Ritchie, L., & Wilcox, M. H. (2021). Evidence Review of Physical Distancing and Partition Screens to Reduce Healthcare Acquired SARS-CoV-2. *Infection Prevention in Practice*, 3(2), 100144. <https://doi.org/10.1016/j.infpip.2021.100144>
- Rukmana, N. M., Putri, J. M., & Novariana, N. (2020).

- Hubungan Pengetahuan dengan Perilaku Pemakaian Alat Pelindung Diri (APD) pada Perawat di Lampung. *Jurnal Ilmu Kesehatan Indonesia (JIKSI)*, 1(2), 1–5. Retrieved from <http://jurnal.umitra.ac.id/index.php/JIKSI/article/view/412>
- Sa'adah, L. (2017). *Hubungan Pemakaian Alat Pelindung Diri (APD) dengan Kejadian Kecelakaan pada Pekerja Penderes di PTPN III Kebun Sei Silau Tahun 2017*. Universitas Sumatera Utara. Retrieved from <https://repositori.usu.ac.id/handle/123456789/2121>
- Sarkar, B., Sarkar, K., & Sengupta, P. (2017). Covid Control Strategy-Is There Any Light at The End of The Tunnel. *Journal of Family Medicine and Primary Care*, 6(2), 169–170. <https://doi.org/10.4103/jfmpc.jfmpc>
- Sembiring, K., Rahman, S., & Tasalim, R. (2022). Analisis Faktor Penyebab Stress Tenaga Kesehatan di Masa Pandemi Covid-19; Narative Review. *Caring Nursing Journal*, 6(1), 18–25. Retrieved from <https://journal.umbjm.ac.id/index.php/caring-nursing/search>
- Sim, E. B., Kim, H. wook, & Noh, H. (2022). Cases of Dental Clinic Visits by COVID-19-Confirmed Patients. *International Journal of Dental Hygiene*, 20(4), 739–747. <https://doi.org/10.1111/idh.12623>
- Sudarmi, Rohani, Irianto, & Anggraeni, N. P. D. A. (2022). Determinants of Affecting Factors Mortality of in The Elderly Covid-19 Patients. *Jurnal Kesehatan Prima*, 16(1), 25–33. <https://doi.org/10.32807/jkp.v16i1.812>
- Sugiyono. (2020). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. (Sutopo, Ed.) (2nd ed.). Bandung: CV Alfabeta.
- Suwaryo, P. A. W., & Yuwono, P. (2017). Faktor-Faktor Yang Mempengaruhi Tingkat Pengetahuan Masyarakat dalam Mitigasi Bencana Alam Tanah Longsor. *The 6th University Colloquium 2017 Universitas Muhammadiyah Magelang*, 305–314. Retrieved from <https://journal.unimma.ac.id/index.php/urecol/article/view/1549>
- Tim Kerja Kementerian Dalam Negeri. (2013). *Pedoman Umum Menghadapi Pandemi Covid-19 Bagi Pemerintah Daerah : Pencegahan, Pengendalian, Diagnosis dan Manajemen*. *Journal of Chemical Information and Modeling* (Vol. 53). Jakarta. <https://doi.org/10.1017/CBO9781107415324.004>
- Utami, N., Fauzan, A., & Rahman, E. (2020). Hubungan Masa Kerja, Pengetahuan dan Sikap Tenaga Kesehatan dengan Kepatuhan Penggunaan Alat Pelindung Diri (APD) di Puskesmas Cempaka Kota Banjarmasin Tahun 2020. *Concept and Communication*, null(23), 301–316. Retrieved from <http://eprints.uniska-bjm.ac.id/3095/>
- Widyaningsih. (2012). *Hubungan Faktor Predisposisi dengan Implementasi Pemakaian Alat Pelindung Diri pada Tenaga Kerja di PT Suwastama Pabelan Kartasura*. Universitas Sebelas Maret. Retrieved from <https://digilib.uns.ac.id/dokumen/detail/25556/Hubungan-Faktor-Predisposisi-Dengan-Implementasi-Pemakaian-Alat-Pelindung-Diri-Pada-Tenaga-Kerja-Di-PT-Suwastama-Pabelan-Kartasura>
- Wong, E. L.-Y., Ho, K.-F., Dong, D., Cheung, A. W.-L., Yau, P. S.-Y., Chan, E. Y.-Y., ... Wong, S. Y.-S. (2021). Compliance with Standard Precaution and Its Relationship with Views on Infection Control and Prevention Policy among Chinese University Students during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 18(7). <https://doi.org/10.3390/ijerph18073420>
- World Health Organization. (2020). WHO SAVE LIVES: Clean Your Hands. World Health Organization. Retrieved from <https://www.who.int/infection-prevention/campaigns/clean-hands/en/>
- Zeb, S., & Ali, T. S. (2021). Factors Associated with The Compliance of Standard Precaution; Review Article. *Journal of the Pakistan Medical Association*, 71(2 B), 713–717. <https://doi.org/10.47391/JPMA.416>
- Żóltowska, B., Barańska, I., Szczerbińska, K., Różańska, A., Mydel, K., Sydor, W., ... Wójkowska-Mach, J. (2021). Preparedness of Health Care Workers and Medical Students in university hospital in Krakow for COVID-19 Pandemic within The CRA-CoV Project. *Journal of Clinical Medicine*, 10(16). <https://doi.org/10.3390/jcm10163487>