Knowledge And Practice Of Dental Clinic Students In Preventing The Transmission Of Covid-19

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ABSTRACT

Background: *There is a risk of Covid-19 cases occurring between dental practitioners and patients during dental procedures. The inhaled aerosol contains the Covid-19 virus causes dentists, dental nurses or dental clinic students to have a significant risk of transmitting Covid-19. It is important for dental clinic students to have good knowledge and practice in preventing the transmission of Covid-19, especially in dental practice. One of the problems with implementing the prevention of transmission of Covid-19 is the application of standard precautions hand washing which are still often overlooked/ignored.*
Method: *This research is descriptive study with cross sectional approach to describe of the knowledge and practice of dental students in the prevention of Covid-19 transmission in the new normal era at RSGM Unimus. The population was the total of all dental clinic students at RSGM Unimus after deducting the samples that were used as respondents in the validity and reliability test that is 137 people. The sampling technique is simple random sampling with the results of 64 respondents. The variables studied were age, gender, years of practice, knowledge and practice in preventing Covid-19 transmission.*
Result: *As many as 73.4% of respondents had good knowledge and as many as 82.8% of respondents had sufficient practice in preventing the transmission of Covid-19 in the new normal era.*
Conclusion: *Most of the respondents had good knowledge and sufficient practice in preventing the transmission of Covid-19 in the new normal era.*

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INTRODUCTION

The coronavirus was identified in Wuhan, China, in December 2019.[5] After the virus infected more than 118,000 people in 114 countries and caused 4,291 deaths, the WHO finally declared the coronavirus outbreak a global pandemic on March 11, 2020.[20] The rapid increase in Covid-19 cases can be attributed to the highly contagious nature of the virus.[21] During the critical period of the Covid-19 pandemic, healthcare workers were on the front lines, treating patients directly and playing a vital role in reducing the death toll from the disease.[8,14]

Transmission of SARS-CoV-2 from infected individuals can occur during dental procedures. Dental practitioners are at high risk of transmission due to exposure to saliva, blood, mucous membranes, oral fluids, contaminated instruments and surfaces, and the production of aerosols/droplets during dental procedures. Given the risk of exposure, it is essential to follow all strict and appropriate infection prevention and control measures, especially in healthcare facilities.[5,11,21] By implementing isolation precautions during patient visits, which include standard precautions and transmission precautions, infection prevention and control efforts in dental and oral health services at primary health facilities can be carried out during the period of adaptation to new habits.[6] Key indicators of success in preventing the transmission of the Covid-19 virus are good knowledge and compliance among health workers.[4,10] Rizkika & Adi (2021) stated that hospital areas and dental practices are potentially affected by COVID-19 infection, and the risk of cross-infection between patients and dentists can occur, as a number of dental procedures generate a large amount of splatter and aerosols.[18]

Based on data from the Unimus Dental Hospital from December 2021 to February 2022, there were 365 positive results from antibody (antigen) tests on patients and 2,555 dental procedures performed by young dentists. The results of a pre-research survey conducted by the researcher in the form of an online questionnaire distributed to four young dentists about the obstacles/barriers/problems faced by young dentists in implementing Covid-19 transmission prevention measures showed that the Covid-19 transmission prevention procedure that is still often overlooked/neglected by young dentists is hand washing. Based on the above description, the researcher was interested in determining the knowledge and practices of young dentists in preventing Covid-19 transmission in the New Normal era at the Dental and Oral Hospital of Muhammadiyah University Semarang.

RESEARCH METHOD

This study is an analytical observational study using a cross-sectional approach. The study was conducted from December 2022 to January 2023 at the Integration Clinic of RSGM Unimus, Jalan Kedungmundu No. 22, Sendangmulyo, Tembalang, Semarang City, Central Java 50273. This study was approved by the Health Research Ethics Committee (KEPK) of the Faculty of Public Health, Muhammadiyah University of Semarang, with No : 735/KEPK-FKM/UNIMUS/2022.

The research population consisted of all active young dentists from the first to seventh batches at the Dental and Oral Hospital of Muhammadiyah University Semarang, minus the sample used as respondents in the validity and reliability test, which was 177 - 40, resulting in 137 people. The sampling technique used in this study was simple random sampling conducted by lottery without repetition. Meanwhile, the sample size calculation used the Slovin formula, resulting in a sample size of 58 individuals.

Data collection for this study was conducted through interviews using a questionnaire to collect data on respondents' personal identities, including name, age, gender, length of practice, and knowledge of young dentists in preventing Covid-19 transmission in the new normal era, as well as observation using an observation

sheet to observe the practices of young dentists in preventing Covid-19 transmission in the new normal era. The validity test of the questionnaire instrument in this study used the pearson product moment correlation test. The table r at a significance level of 5% was 0.312. The validity test was conducted at the Unimus RSGM with a total of 40 young dentists who were not included in the research sample. The knowledge questionnaire consisted of 25 questions, of which 9 were invalid. The reliability test of the questionnaire instrument in this study used the Cronbach's alpha formula. The instrument was considered reliable if the alpha value was at least 0.6. The reliability test of the knowledge questionnaire yielded an alpha value of 0.74, so it can be concluded that the questions in the questionnaire were reliable.

RESULTS

Research Respondent Characteristics

The results of processing the data on the characteristics of the research respondents are presented in Table 1.

Table 1. Characteristics of Research Respondents

Characteristics	n	%
Age		
Adolescents (12-25 years old)	60	93.75
Adults (26-45 years old)	4	6.25
Total	**64**	**100**
Gender		
Male	15	23.4
Female	49	76.6
Total	**64**	**100**
Years of Practice		
< 1 Year	34	53.1
1-< 2 Years	13	20.3
2-< 3 Years	13	20.3
> 3 Years	4	6.3
Total	**64**	**100**

Table 1 shows that based on the results of research conducted on 64 young dentists at RSGM Unimus, data was obtained on age characteristics, with the majority of respondents being in the adolescent age category (12-25 years) totaling 60 people (93.75%). Adolescence is an age where a person begins to develop into adulthood. This age group tends to have self-confidence, be open to new experiences, and be persistent in achieving their goals. According to Yusuf (2012), students aged 19-25 years are categorized as late adolescence to early adulthood or included in the developmental stage, where at this age they have stability in themselves to do everything and can adapt to new situations, such as remembering things they have learned before, thinking creatively, and analogical reasoning.[23] The characteristics of respondents based on gender in this study showed that they were dominated by females. There were 49 female respondents (76.6%) and 15 male respondents (23.44%). The large number of female dentists is due to the fact that female students dominate the dentistry faculty. Based on research conducted by Suryani and Asia (2022) with the aim of determining the knowledge of preclinical students at the Usakti Faculty of Dentistry regarding the prevention of COVID-19 infection in dental practice, with a total of 131 respondents, the results showed that there were 109 female respondents (83.2%), while male respondents numbered 22 (16.8%).[22] Evidence shows that in the

health profession, is usually dominated by women because it is associated with their greater ability to care, diligence, patience, and accuracy compared to men.[12]

The longest period of practice for young dentists in this study was less than one year. In a study conducted by Ridarsyah, Sriatmi, & Susanto (2022) with the aim of analyzing various factors related to PPE compliance among dentists at the Sultan Agung General Hospital in Semarang, it was also found that most respondents were young with less than 3 years of work experience, namely 40 people (78.4%) out of a total of 51 respondents. Young age and short work experience cause young dentists to not fully understand the characteristics of the professional work that must be done, including in terms of occupational hazards that may occur, such as the possibility of work accidents or infections due to negligence in implementing health protocols.[17]

Knowledge in Preventing the Spread of COVID-19 in the New Normal Era

The questionnaire on knowledge of Covid-19 transmission prevention in the new normal era contained 16 questions with a grid covering Coronavírus Disease 2019 (COVID-19), standard precautions, and transmission precautions. Table 2 shows the number and percentage of each knowledge question item on preventing COVID-19 transmission in the new normal era by young dentists at RSGM Unimus.

Table 2. Frequency Distribution of Knowledge on COVID-19 Prevention in the New Normal Era

No.	Question	Correct		Incorrect	
		n	%	n	%
1.	Dental procedures in oral health care services have the potential to transmit the SARS-CoV-2 virus to dentists, other healthcare workers, patients, or visitors.	59	92.2	5	7.8
2.	Standard precautions are the minimum PPI measures that must be implemented routinely and continuously in all healthcare facilities and applied to all patient care procedures regardless of the patient's infection status.	59	92.2	5	7.8
3.	Standard precautions consist of hand hygiene and the use of personal protective equipment (PPE).	62	96.9	2	3.1
4.	The hand washing procedure recommended by the WHO is at the following five moments: before touching the patient, before performing aseptic procedures, after touching the patient's bodily fluids, after touching the patient. and after coming into contact with the patient's environment.	62	96.9	2	3.1
5.	The proper duration for hand disinfection using alcohol-based hand rub (ABHR) is 20-30 seconds	61	95.3	3	4.7
6.	Personal protective equipment (PPE) acts as a barrier against exposure to infectious materials and contaminants from blood, body fluids, or respiratory secretions of patients.	62	96.9	2	3.1
7.	It is permissible to share the same PPE among healthcare workers.	55	85.9	9	14.1
8.	Face shields can replace masks.	63	98.4	1	1.6
9.	Transmission precautions are the second layer of isolation precautions, which are preventive and control measures implemented when providing care to patients with or without a diagnosed infectious disease.	62	96.9	2	3.1
10.	Transmission precautions consist of contact transmission precautions, droplet transmission precautions, and airborne transmission precautions.	64	100	0	0
11.	Contact transmission precautions are precautions aimed at breaking the chain of transmission of microorganisms that cause infection through exposure to droplets when coughing, sneezing, or talking.	19	29.7	45	70.3
12.	Several contact transmission prevention measures can be implemented by applying the principles of four-handed dentistry and disinfecting work	61	95.3	3	4.7

	surfaces.				
13.	Droplet transmission precautions are precautions aimed at breaking the chain of transmission of microorganisms that cause infections transmitted through direct or indirect contact.	16	25	48	75
14.	Airborne transmission precautions aim to prevent the spread of infection caused by bioaerosol particles smaller than 5 µm that are expelled from the respiratory tract and actions that generate aerosols.	64	100	0	0
15.	One of the antiseptic mouthwashes recommended for use in preventing the spread of the COVID-19 virus is 1% hydrogen peroxide (H_2O_2).	36	56.25	28	43.75
16.	Healthcare workers who have had contact with patients suspected of having COVID-19 are advised to rinse their mouths with antiseptic mouthwash 3-4 times a day.	42	65.6	22	34.4

Furthermore, if the knowledge score on preventing COVID-19 transmission in the new normal era is categorized, the results can be seen in Diagram 1, which shows that most respondents (73.4%) are in the good category. This may be because the respondents are health science students who have been taught about virus transmission and prevention measures during their education.

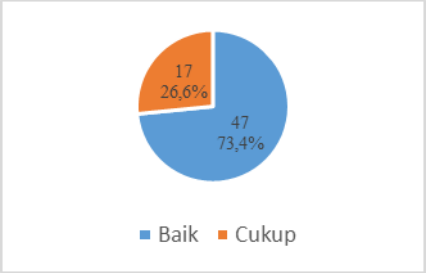

Diagram 1. Frequency Distribution of Respondents Based on Knowledge of Covid-19 Transmission Prevention in the New Normal Era.

Practices in Preventing COVID-19 Transmission in the New Normal Era

The observation sheet for practices in preventing COVID-19 transmission in the new normal era consists of 17 statements with a grid focusing on standard precautions and transmission precautions. Table 3 shows the number and percentage of each item in the statements regarding practices in preventing COVID-19 transmission in the new normal era by young dentists at RSGM Unimus.

Table 3. Frequency Distribution of Practices in Preventing COVID-19 Transmission in the New Normal Era

No.	Statement	Performed		Not Implemented	
		n	%	n	%
	Standard Precautions				
1.	Perform hand washing procedures properly and correctly	64	100	0	0
2.	Using a head cap during dental procedures	11	17.2	53	82.8
3.	Wearing eye protection (goggles)/face protection (visor/face shield) when performing dental procedures	0	0	64	100
4.	Using medical gloves when performing dental procedures	64	100	0	0
5.	Using masks/respiratory protective equipment when performing dental procedures	64	100	0	0
6.	Wearing protective clothing/isolation gown when performing dental procedures	64	100	0	0
7.	Wearing protective footwear (boots or cover shoes) when performing dental procedures	64	100	0	0
	Transmission Precautions				

	Transmission Precautions Contact				
1.	Limiting the number of people in the dental practice room during treatment (application of the four-handed dentistry principle)	64	100	0	0
2.	Management of environmental surface disinfection	64	100	0	0
	Precautions for Droplet Transmission				
1.	Application of CPTS/ABHR	64	100	0	0
2.	Physical distancing	0	0	64	100
3.	Use of masks	64	100	0	0
4.	Application of coughing and sneezing etiquette	0	0	64	10
	Airborne Transmission Awareness				
1.	Use of PPE	64	100	0	0
2.	Decontamination of work surfaces	64	100	0	0
3.	Use of additional equipment for isolating the work area	58	90.6	6	9.4
4.	Patients rinse with antiseptic mouthwash	64	100	0	0

Furthermore, if the practice score in preventing Covid-19 transmission in the new normal era is categorized, the results can be seen in Diagram 2, namely that most respondents (82.8%) are in the sufficient category. Based on the observations and interviews conducted by the researcher with several respondents, at the time of the study, the implementation of the Personal Protective Equipment (PPE) protocol by RSGM Unimus for young dentists when treating patients was no longer required to use Level 3 Personal Protective Equipment (PPE), but only Level 2 Personal Protective Equipment (PPE). This may be due to the decline in Covid-19 cases in Indonesia.

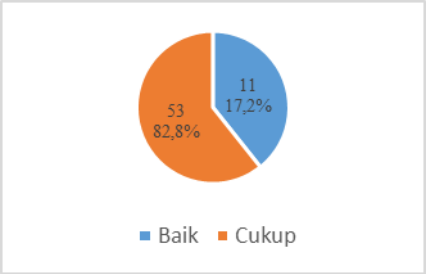

Diagram 2. Frequency Distribution of Respondents Based on Practices in Preventing Covid-19 Transmission in the New Normal Era

Practices in Preventing Covid-19 Transmission in the New Normal Era Based on Age, Gender, and Length of Practice

This study shows that young dentists in the adult age category (26-45 years) have a higher percentage of good knowledge of Covid-1 9 transmission prevention compared to young dentists in the adolescent age category (12-25 years). In terms of Covid-19 transmission prevention practices, both age groups are dominated by the adequate category. Young female dentists had a higher percentage of good knowledge of Covid-19 transmission prevention compared to young male dentists. In terms of Covid-19 transmission prevention practices, male dentists were predominantly in the good category, while female dentists were all in the adequate category. Young dentists with more than three years of practice had the highest percentage in the good category in terms of knowledge of COVID-19 transmission prevention, while the lowest percentage was found among young dentists with one to less than two years of practice. In terms of COVID-19 transmission prevention practices, all groups of practice duration were predominantly in the adequate category.

Maturity influences thinking patterns, where at this age people are more mature in their actions and understand the risks that may occur. Women have also been proven to have higher levels of diligence and accuracy than men. The longer a person works, the more experience and insight they will have, resulting in better performance. However, it is possible that certain behaviors or habits may decline over time. This non-compliance can be influenced by several factors, such as students forgetting, feeling lazy, or not having enough time. Research by Saptorini, Fani, & Setijaningsih (2021) on medical record practitioners in hospitals shows a relationship between gender and compliance with health protocols, where women tend to be more compliant than men.[19] Another study conducted by Ridarsyah, Sriatmi, & Susanto (2022) stated that there was no relationship between age, gender, and length of service and compliance with PPE use.[17]

DISCUSSION

The results of the study show that 92.2% of respondents understand that dental procedures in dental and oral health services have the potential to transmit the SARS-CoV-2 virus to dentists, other practitioners, patients, or visitors. These findings are consistent with the study by Suryani and Asia (2022), which showed that 77.9% of respondents knew how COVID-19 could be transmitted in dental practice.[22] The high level of knowledge among respondents about how the virus can spread and transmit to others can serve as a foundation for understanding efforts to prevent COVID-19 transmission, particularly in dental practices. Furthermore, in 2022 Ardlina et al. explained that the results of the respondent characteristic analysis showed that 134 respondents (78.36%) fell into the good category for preparedness of dental practice during the COVID-19 pandemic.[2]

Most respondents were aware of standard precautions, including their definition, maintaining hand hygiene such as the five moments of hand hygiene recommended by the WHO and the use of alcohol-based hand rub (ABHR), as well as the use of personal protective equipment (PPE). The results of this study are supported by Fathurrahman's (2015) study of 205 clinical students at the Faculty of Dentistry, University of North Sumatra, which stated that 86.8% of respondents had a good understanding of standard precautions for patients with HIV, Hepatitis B, Hepatitis C, and tuberculosis.[3] Another study conducted by Suryani and Asia (2022) found that 68.7% of respondents were aware of the various standard precautions for all patients.[22] It is important for students to have a good understanding of these standard precautions so that they can take the appropriate actions to reduce and prevent the risk of cross-infection in dental practice. A total of 9 respondents still answered incorrectly regarding the prohibition of sharing the same PPE between health workers. The PPE used during procedures is expected to meet standards so that it is effective in preventing the spread of viruses. Most PPE can only be used once (single use), and a small portion can be reused after undergoing a sterilization process.[13]

Most respondents knowledge of the definitions of contact transmission precautions and droplet transmission precautions was still largely incorrect. Only 19 respondents (29.7%) correctly answered the definition of contact transmission precautions, and 16 respondents (25%) correctly answered the definition of droplet transmission precautions. Material on transmission precautions had been presented during education, but many respondents had forgotten it when the interviews were conducted. The circumstances at the time of data collection also had an influence, as respondents were sometimes unfocused and careless when answering

questions. Regarding knowledge of antiseptic mouthwash, 28 respondents answered incorrectly, and 22 respondents answered incorrectly regarding the use of antiseptic mouthwash for healthcare workers. Hydrogen peroxide (H_2O_2) mouthwash is recommended because the SARS-CoV-2 virus is susceptible to oxidation, which can reduce the viral load in saliva. Healthcare workers who have a history of contact with patients suspected of having Covid-19 are advised to gargle 3-4 times a day.[6]

The results of the study show that in implementing standard precautions, all young dentists (100%) have performed hand washing procedures properly and correctly before and after performing procedures on patients and when performing dental procedures, they have used medical gloves, masks/respiratory protective equipment, protective clothing/isolation gowns, and protective shoes (cover shoes). The use of head caps during dental procedures was only done by 11 respondents (17.2%), all of whom were male. According to the interviews, several respondents stated that this was because all female respondents wore hijabs and their use was not mandatory except for procedures performed in the operating room (OR). None of the respondents used protective eyewear (goggles)/face shields when performing dental procedures. According to the respondents, their use was only required for certain procedures that produced aerosols/droplets during dental care procedures, such as scaling. There was a difference in understanding between the respondents and the PPE protocol established by the Unimus Dental Hospital, which only requires the use of level 2 PPE when performing procedures on patients. Level 2 PPE consists of eye protection (goggles)/face protection (visor/face shield), head cover/head cap, mask/respiratory protective equipment, protective clothing/isolation gown, and medical gloves. Research conducted by Pratiwi, Sorena, & Dianti (2016) also found similar results, namely that almost all nurses did not use head coverings (89%) because some nurses said they were in a hurry so they did not have time to use them, while others said that they already wore hijabs so they did not need to use them. The m also found that almost all nurses did not use goggles/face shields (92%) because the facilities provided were not sufficient for the number of nurses available and because they were in a hurry.[15] The findings that are particularly compelling and more specific refer to the research conducted by Arbianti, Kusuma and Meiliana Hanirizqy (2019) which demonstrated a significant relationship between knowledge and compliance in the use of PPE. The better a person's knowledge, the higher their level of compliance. These findings show that the compliance in the use of PPE highly relates and connected with the knowledge in preventing the COVID-19 transmission which is discussed by student before.[1]

The implementation of contact transmission precautions from the research results showed that all young dentists (100%) had implemented restrictions on the number of people in the dental practice room during treatment (application of the four-handed dentistry principle), and every young dentist who was to be the operator had to work with another young dentist who would act as the assistant operator. All young dentists (100%) have also carried out disinfection of the work environment surface. Every young dentist who will perform an action will be given tissue containing alcohol to dean the work environment surface, such as the dental unit, after performing dental procedures. Dental instruments used during procedures are washed with running water and soap, then packaged in sterile pouches/single-use sterilization bags per instrument and sterilized using a sterilizer (pressure steam sterilizer). Research conducted by Rahmah, Purnamasari, & Muthi'ah (2022) also found that all dentists in Samarinda City sterilize instruments, sterilize rooms, and use ethanol as a disinfectant.[16]

The implementation of droplet transmission precautions based on research findings shows that all young dentists (100%) have implemented CPTS/ABHR. Based on the researcher's observations at the Unimus RSGM Integration Clinic, facilities for hand washing, namely sinks, water taps, liquid soap, and dry tissues, are available in every room where young dentists perform procedures (cubicle rooms/communal rooms). Several ABHR (Alcohol-Based Hand Rub) units are also provided within the integrated clinic for use by young dentists at any time. All young dentists (100%) also wore masks, which are mandatory when entering the integrated clinic. None of the young dentists practiced physical distancing, as this is no longer a concern due to the decline in Covid-19 cases in Indonesia, and young dentists carry out their activities as usual or under normal circumstances. All young dentists also did not practice coughing and sneezing etiquette. From the researcher's observations, no young dentists were found to be coughing or sneezing while performing dental procedures. but from the respondents statements, material on the application of coughing and sneezing etiquette had been conveyed at the beginning of their education as young dentists (co-ass). The results of this study are in contrast to the study conducted by Marsabessy, Kawatu, & Asrifuddin (2022), which stated that the implementation of physical distancing in the North Sulawesi Provincial Culture Office was mostly in the good category, namely 56.6%, the fairly good category, namely 40.0%, and the not good category, namely 4.4%.[7]

The implementation of airborne transmission precautions from the research results showed that all young dentists (100%) had implemented the use of PPE. Young dentists used Level 2 Personal Protective Equipment (PPE) except for head covers/head caps and protective eyewear (goggles)/face shields, which were used during certain procedures. s also provided patients with personal protective equipment in the form of isolation gowns during procedures PPE was put on in the donning room before entering the integrated clinic and removed in the doffing room after leaving the integrated clinic. All young dentists (100%) also carried out environmental surface decontamination: as well as environmental surface disinfection as described above. After shift change, young dentists must immediately clean and sterilize the room so it can be used by young dentists on the next shift. Nurses in the integrated clinic will control the cubicle/communal rooms that have been used. The use of additional equipment for isolating the work area by the respondents in this study was mostly carried out. The tool most often used by young dentists during procedures was the saliva ejector because this tool is included in the patient set given to young dentists when they are about to perform procedures on patients. The patient set consists of a rinsing cup, saliva ejector, and polybib. Rubber dams are usually used during root canal treatment (RCT). The use of additional equipment for isolating the work area is not always used, such as in the oral disease department or prosthodontics department, where it is rarely used. All young dentists (100%) have instructed their patients to rinse with antiseptic mouthwash during dental procedures. The types of mouthwash commonly used for patients are mouthwashes containing 1% povidone-iodine or 0.2% chlorhexidine gluconate. The results of this study by are supported by a study by Rahmah, Purnamasari, & Muthi'ah (2022), which states that more than the average number of dentists in Samarinda City recommend the use of mouthwash before treatment and recommend the use of mouthwash at home containing povidone iodine and chlorhexidine.[16] The high level of consistency between the procedure and the implementation of COVID-19 spread prevention practices by dentists is a standard, not an option.[9]

CONCLUSION

Young dentists at Unimus Hospital have good knowledge (73.4%) of Covid-19 transmission prevention in the new normal era. The knowledge aspects related to preventing the transmission of COVID-19, including information about the Coronavirus Disease 2019 (CO V1D-1 9), standard precautions, and transmission precautions, are mostly well- covered, except for the least covered aspects, which are the definitions of contact transmission precautions and droplet transmission precautions. Most young dentists (82.8%) at RSGM Unimus have sufficient practice in preventing COVID-19 transmission during the new normal era. The aspects of practice in preventing COVID-19 transmission regarding standard precautions and transmission precautions are well-covered, except for the least covered aspects, namely the use of head covers/head caps, the use of eye protection gogglesiface shields, the implementation of physical distancing, and the implementation of coughing and sneezing etiquette.

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