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Overview of the Infection Control Risk Assessment (ICRA) Implementation in Dental Practice at RSGM Unimus

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ABSTRACT AC T

(ABSTRACT IN ENGLISH)

Infections that are present while undergoing treatment or obtained from health services are called *Healthcare Associated Infections* (HAIs). The impact of this incident is the length of treatment and costs provided, increased morbidity, and can result in death. One of the many occupations in the world that has the highest risk of infection transmission, namely health workers working in dentistry, this is supported by the fact that most of the human microbial pathogens originate from oral secretions, while these health workers require their proximity to the patient's oropharynx. The increase in the number of HAIs occurs due to the lack of application of infection control so that we need to carry out an assessment of this implementation. *The Center for Disease Control and Prevention* (CDC) in 2016 issued standardized *Infection Control Risk Assessment (ICRA) guidelines to assess the risk of infection in dental and oral health services* . The purpose of this research namely describes how the description of the implementation of ICRA in dentist practice at RSGM Unimus. The type of research used is observational, with quantitative analysis methods, and a descriptive research design. The results showed that overall, the implementation of infection control at RSGM Unimus had a percentage of 82%, this figure was included in the low infection risk category, meaning that RSGM Unimus was good at implementing infection control programs.

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INTRODUCTION

Healthcare Associated Infections (HAIs) or commonly referred to as nosocomial infections are a condition of infection that is present while undergoing treatment or obtained from health services. This infection does not only affect patients, but can occur in health workers and visitors who are in health care facilities. The time it takes for the infection to grow is the first 48 hours after admission to the hospital, or 30 days after treatment is received (Khan et al., 2017) .

The Center for Disease Control and Prevention (CDC) found that there are approximately 1.7 million patients annually who are hospitalized with HAIs and more than 98,000 patients or 1 in 17 patients lose their lives due to these HAIs (Sartelli et al., 2018) . Meanwhile, according to estimates reported by WHO, there are 15% of all patients receiving treatment in hospitals suffering from HAIs. The highest incidence rates are in the Eastern Mediterranean and Southeast Asia, at 11.8% and 10%, while Europe and the Western Pacific have prevalence rates of 7.7% and 9% (WHO, 2020) . Data from the Indonesian Ministry of Health in 2013 shows that Indonesia, which is a developing country, has a fairly high prevalence of HAIs, which is 6-16% (Hapsari et al., 2018) .

According to WHO in 2020, there are two risk factors that are the cause of a nosocomial infection or HAIs, namely risk factors related to resources and those that are not related or independent of resources (WHO, 2020) . Risk factors related to resources include; poor environmental hygienic conditions, inadequate waste disposal, poor infrastructure, inadequate equipment, understaffed, overcrowding/large number of patients, and the absence of local and national guidelines and policies, while for risk factors that are not related to sources power including; prolonged and inappropriate use of invasive devices and antibiotics, high-risk procedures, immunosuppression, and inadequate application of standard precautions and isolation (WHO, 2020) .

One type of work that has the highest risk of HAIs is health workers working in the field of dentistry, because according to research conducted by Aldahlawi and Afifi (2020), most human microbial pathogens originate from oral secretions, while health service providers in the field of dentistry requires close proximity to the patient's oropharynx and the treatment procedures used can cause blood droplets or *aerosols* (Aldahlawi & Afifi, 2020) .

Given the magnitude of the impact caused by HAIs, infection prevention and control is important to do (Junaidi, Kurnianti R., 2018) . One form of this action is the implementation of *Infection Control Risk Assessment* (ICRA), according to Lardo (2016) ICRA is a strategy in controlling an infection, by taking into account the possibility and continuity of field application, and the outcomes can be accounted for as a prevention program and an improvement in service quality. (Lardo, 2016) .

Infection prevention and control assessments have been carried out by various world organizations, one of which is the CDC which has four *assessment tools* for ICRA, namely *Acute Care Hospital, Hemodialysis Facilities, Long Term Care Facilities* , and *Outpatient Settings* . In 2016, the CDC published the ICRA guidelines *in Dental Health Care Setting* which is a development of the ICRA for *Outpatient Settings* and includes 12 assessment aspects, namely administrative actions, infection prevention education and training, health worker safety which includes

prevention of the spread of pathogens through blood and its implementation if exposed, hand hygiene, personal protective equipment (PPE), respiratory/cough hygiene ethics, safety of sharps, safety of injection practices, sterilization and disinfection of tools, environmental infection control, and quality of dental unit water (CDC, *2016*) .

Based on the background described above, the researcher deems it necessary to carry out an assessment of the application of *Infection Control Risk Assessment* (ICRA) in Dentist Practice at RSGM Unimus.

This study aims to describe the description of the implementation of *Infection Control Risk Assessment* (ICRA) based on 12 parts of the instrument issued by the CDC in dental practice at RSGM Unimus .

RESEARCH METHOD

This research was conducted in July-August 2021 and is a type of observational research, using a quantitative analysis method, as well as a descriptive research design. This research was conducted at the Dental and Oral Hospital of Muhammadiyah University Semarang, Indonesia. The research subjects were 57 respondents consisting of 14 dentists, 39 dental professional program students, 2 dental nurses, and 2 PPI teams. The selection of the subjects was determined based on the inclusion criteria and the number of subjects obtained using the proportionate stratified random sampling technique and the Slovin formula.

The variable in this study is the application of infection control. The type of data used is primary data and secondary data, primary data is data collected and processed independently by researchers from the answers to questionnaires filled out by respondents, the questionnaire used in this study is a questionnaire adapted from the CDC questionnaire, namely Infection Control Risk *Assessment for Dental Healthcare Setting* , in order to provide detailed information that can enhance the quality of health care facilities regarding the implementation of infection prevention and control, the questionnaire has been tested reliably and validly. While secondary data is data originating from RSGM Unimus in the form of data on the number of health workers and data on patient visits at RSGM Unimus. The answers in this study used the Guttman scale, namely positive responses if the respondent chose the Yes answer which had a value of 1 and a negative answer if the respondent chose the No answer which had a value of 0. The evaluation of infection control was then maintained at 1%-100%. Between 51 and 75 percent, the application of infection control is quite good and the risk of infection is moderate (medium risk), and between 76 and 100 percent, the application of infection control is good and the risk of infection is low (low risk). Less than 50 percent of respondents report that the implementation of infection control is inadequate and that the risk of infection is high (high risk) (Putri et al., 2017).

This research has received permission from the training and management department of the Dental and Oral Hospital of the Muhammadiyah University of Semarang, Indonesia. Data analysis used univariate analysis presented in the frequency distribution table.

RESULTS AND DISCUSSION

Characteristics of Respondents

Characteristics of Respondents based on Gender in health workers at RSGM Unimus

Table.1 Distribution of Respondent Characteristics by Gender among Health Workers at RSGM Unimus

No	Health Worker Status	Amount	Gender		Percentage	
			Man	Woman	Man	Woman
1	Dentist	14	4	10	28.6%	71.4%
2	Dentist Professional Program Student	39	10	29	25.6%	74.4%
3	Dentist	2	-	2	0%	100%
4	Infection Control Prevention Team	2	1	1	50%	50%
	Total	57	15	42	26.3%	73.7%

Source: *Primary data that has been processed*

Table 1: demonstrates that 42 respondents, or 73.7 percent, were female, making them the majority in this study.

Characteristics of Respondents based on Age of health workers at RSGM Unimus

Table.2 Distribution of Respondent Characteristics by Gender among Health Workers at RSGM Unimus

Respondents	Age Group	Gender		Total	Percentage	
		Man	Woman		Man	Woman
Health workers	20-30	12	38	50	24%	76%
	31-40	2	3	5	40%	60%
	41-50	0	1	1	0%	100%
	>50	0	1	1	0%	100%

Source: *Primary data that has been processed*

Table 2 shows that the majority of respondents are in the 20-30 year age group with a total of 50 respondents and the least are respondents in the 41-50 year age group and >50 years with 1 respondent in each group.

Results of Research on Application of Infection Control at RSGM Unimus Based on Overall ICRA Questionnaire

Frequency Distribution of Research Results on Application of Infection Control at RSGM Unimus Based on Overall ICRA Questionnaire

Table.3 Data Distribution of Research Results on Implementation of Infection Control at RSGM Unimus Based on Overall ICRA Questionnaire

No	Part	Positive Response	Negative Response	Number of Responses	Percentage of Positive Responses	Category
1	Administrative Measures	100	14	114	88%	Good and Low Infection
2	Infection Prevention Education and Training	80	34	114	70%	Fairly Good and Moderate Infection Risk
3	Dental Health Care Personnel Safety	194	34	228	85%	Good and Low Infection
4	Program Evaluation	91	23	114	79%	Good and Low Infection
5	Hand Hygiene	102	12	114	89%	Good and Low Infection
6	Personnel Protective Equipment (PPE)	106	8	114	93%	Good and Low Infection
7	Respiratory Hygiene/Cough Etiquette	206	74	280	74%	Fairly Good and Moderate Infection Risk
8	Sharp Safety	45	12	57	79%	Good and Low Infection
9	Injection Practices	56	1	57	98%	Good and Low Infection
10	Sterilization and Disinfection of Patient Care Items and Devices	280	62	342	82%	Good and Low Infection
11	Environmental Infection Prevention and Control	194	34	228	85%	Good and Low Infection
12	Dental Unit Water Quality	110	28	138	80%	Good and Low

				Infection
Total	1,564	336	1913	Good and Low Infection Risk (low risk)
Percentage	82%	18%	100%	

Source: *Primary data that has been processed*

Based on table 3, the highest positive response results were found in the safe injection practice section with a percentage of 97% and included in the low infection risk category, meaning that the application of infection prevention and control in the injection practice section has been implemented properly. Meanwhile, the lowest positive response results were in the infection prevention education and training section with a percentage of 70% and included in the moderate infection risk category, meaning that there is still a need to increase the implementation of infection prevention education and training in dentistry practice at RSGM Unimus.

Discussion

Part A: Administrative Actions

Based on the research results in part A, namely the assessment of administrative actions, It was discovered that 88 percent of respondents gave a positive response by answering "yes". It can be seen that the administrative actions that have been carried out at RSGM Unimus are included in the low infection risk category, meaning that their implementation has been well done.

These results are in accordance with the standards issued by the CDC, namely in the implementation of administrative actions there is at least one individual who has the competence regarding infection prevention and control to be responsible for developing regulations and written infection prevention procedures or standard operating procedures (SPO) with reference to the guidelines set out standardized such as the CDC and WHO (CDC, 2016) .

Part B: Infection Prevention Education and Training

According to the 2016 CDC, infection prevention education and training is a fundamental requirement for all health workers. It can cover fundamental principles and practices for preventing the spread of infections in dental and oral health care facilities (CDC, 2016) .

According to the findings of part B of the research, which was an evaluation of infection prevention education and training, 70% of respondents gave a positive response—yes—to the question. It can be seen that the implementation of infection prevention education and training for health workers at RSGM Unimus falls under the category of moderate infection risk. This indicates that the implementation has been fairly successful, but it still needs to be improved on a regular basis, either every year or when new assignments or procedures that affect exposure are received.

Part C: Safety of Health Workers

According to the findings of part C of the study, which dealt with the evaluation of health care workers' safety, 85% of respondents answered "yes" in a positive manner. At RSGM Unimus, it is evident that the health worker safety program has been effectively implemented, placing it in the low infection risk category.

These results are also in accordance with the standards issued by the CDC in 2016, namely infection prevention programs must also meet the needs of health workers, such as vaccination or immunization measures, and post-exposure prophylaxis measures for health workers who require exposure management (CDC, 2016) .

Section D: Program Evaluation

The goal of evaluation is to make infection prevention programs and dental practice procedures work better. This evaluation must be carried out and accompanied by additional feedback, corrective measures, and training if necessary to eliminate issues if infection prevention and control procedures have flaws or issues.

The evaluation of program evaluation, which was the focus of part D's research findings, revealed that 79 percent of respondents answered "yes" in the majority of cases. Program evaluation has been successfully implemented at RSGM Unimus, as evidenced by the fact that it falls under the low infection risk category.

Section E: Hand Hygiene

The assessment of hand hygiene, which was the subject of the research in section E, revealed that 89 percent of respondents answered "yes" in the majority of instances. It tends to be seen that the execution of hand cleanliness by wellbeing laborers at RSGM Unimus remembered for the class of generally safe of contamination, implying that the execution has been all around good.

This result is in line with the CDC's 2016 guidelines, which state that before performing routine dental examinations and surgical procedures, people must also implement hand hygiene and receive education and training on the indications and methods for practicing hand hygiene (CDC, 2016). As a dental and oral service facility, RSGM Unimus must support the implementation of infection prevention and control measures, provide the equipment necessary to adhere to hand hygiene practices, and make sure that all health workers can easily access them.

Section F: Personal Protection Equipment/PPE

Based on the research results in part F, namely the assessment of self-protection equipment, It was discovered that 93 percent of respondents answered yes, which was the majority's positive response. It can be seen that personal protective equipment (PPE) at RSGM Unimus is included in the low infection risk category, meaning that it has been well implemented.

These results are in accordance with the standards issued by the CDC in 2016, namely the provision of education and training regarding indications for selecting the right PPE to be carried out, as well as the availability of the equipment needed to comply with the practice of

using personal protective equipment (PPE), and ensuring that all health workers can easily access it (CDC, 2016) .

Section G: Respiratory Hygiene/Cough Etiquette

According to the findings of the study in Section G, which dealt with the evaluation of cough etiquette and respiratory hygiene, 74% of respondents gave a positive response of "Yes". It can be seen that the implementation of respiratory hygiene/cough etiquette at RSGM Unimus is included in the moderate infection risk category, meaning that the implementation has been quite good but still needs to improve the provision of facilities related to respiratory hygiene and cough etiquette, this is done to support the implementation of infection prevention and control programs.

According to the 2016 CDC, the implementation of respiratory hygiene/cough etiquette strategies that can be carried out include (1) putting up a sign at the entrance that contains instructions for patients with symptoms of respiratory infections to cover their mouth/nose when coughing or sneezing, using a tissue, and cleaning hands after touching respiratory secretions, (2) providing facilities for performing hand hygiene in or near the waiting room, (3) offering masks to patients with respiratory symptoms, and (4) providing a separate waiting room, and (5) facilities Health services must also provide education and training regarding the importance of holding respiratory secretions (CDC, 2016) .

Section H: Sharps Safety

The provision of care in dentistry carries a risk of percutaneous injury (eg, needles, cuts with sharp objects) among healthcare professionals involving burs, needles, and other sharp instruments. Injuries caused by sharp objects have a risk of transmitting blood-borne pathogens to health workers and patients. When cleaning and disposing of sharp instruments, healthcare workers should be aware of the risk of injury.

According to the findings of the research presented in Section H, which dealt with the evaluation of the safety of sharps, 79% of respondents answered "yes" in a positive manner. It tends to be seen that the execution of sharps security at RSGM Unimus is remembered for the low contamination risk class, implying that the execution has been very much carried out.

Part I: Safety of Injection Practices

Based on the results of the research in part I, namely an assessment of the safety of injection practices, it was found that the majority of respondents gave a positive response by answering Yes and the percentage was 98%. It can be seen that the implementation of safe injection practices at RSGM Unimus is included in the low infection risk category, meaning that the implementation has been well implemented.

These results are in accordance with the standards issued by the CDC in 2016, namely the implementation of injection practices must be carried out in a safe and clean place that is free from contamination, besides that the administration must also be considered (for example, needles and cartridges filled with anesthetic are not used simultaneously or repeatedly) (CDC, 2016) .

Section J: Sterilization and Disinfection of Patient Care Items and Equipment

The majority of respondents, 82 percent, gave a positive response by answering "yes" to the assessment of the sterilization and disinfection of patient care goods and equipment, according to the findings of part J of the research. It can be seen that the implementation of sterilization and disinfection of patient care goods and equipment at RSGM Unimus is included in the low infection risk category, meaning that the implementation has been well carried out.

These results are in accordance with the standards issued by the CDC in 2016, namely that every health care facility must have regulations and standard operating procedures (SPO) for cleaning, disinfecting and sterilizing dental instruments and equipment. In addition, health workers must receive training on reprocessing steps to ensure that the instruments and equipment used are safe for patient care (CDC, 2016) .

Part K: Environmental Infection Prevention and Control

According to the findings of the research presented in Section K—the evaluation of environmental infection prevention and control—the majority of respondents answered "Yes," with a percentage of 85%. At RSGM Unimus, it is evident that environmental infection prevention and control has been successfully implemented, placing it in the low infection risk category.

These results comply with the CDC's 2016 standards, which stipulate that a health care facility ought to have written regulations and standard operating procedures (SPO) for the routine cleaning and disinfection of rooms and surfaces with the greatest risk of contamination. In addition, health professionals must receive instruction in infection control, clinical contact control, and room cleaning. (CDC, 2016)

Section L: Dental Health Care Unit Water Quality

According to the findings of section L of the research, which dealt with the evaluation of the dental health care unit's water quality, the majority of respondents answered "yes" with a percentage of 80%. The dental health care unit's water quality can be seen to be in the low infection risk category at RSGM Unimus, indicating that its implementation has been successful.

These results meet the CDC's 2016 standards, which state that a strategy to improve the water quality of dental care units must take into account a number of factors, such as the availability of regulations and standard operating procedures (SPO) that regulate water quality monitoring based on manufacturer instructions (waterline treatment products). dental unit manufacturers), the use of sterile saline or water for surgical irrigation, and the dental unit water quality met EPA drinking water regulations (500 CFU/mL heterotrophic bacterial water) for routine dental water (CDC, 2016) .

CONCLUSION

Respondents with female gender had a higher number and percentage than men, namely 42 respondents (73.7%) and 15 respondents (26.3%), and the age group of respondents was mostly in the age range 21 to 30 years as many as 50 people (87.72%).

Overall, the implementation of infection prevention and control at RSGM Unimus has a percentage of 82%, this figure is included in the low infection risk category, meaning that RSGM Unimus is good at implementing infection control programs.

Of the 12 assessment sections that were carried out based on the CDC questionnaire, the results showed that 10 sections had good results and were in the low infection risk category, and the other 2 sections had fairly good results and were in the moderate infection risk category, so these two sections still need to be carried out. quality improvement and quality. The 10 sections that have a low infection risk category are administrative measures, health worker safety, program evaluation, hand hygiene, personal protective equipment (PPE), safety of sharp objects, safety of injection practices, sterilization and disinfection of patient care goods and equipment, prevention and control environmental infections, and dental health care unit water quality. In contrast, infection prevention education and training and respiratory hygiene/cough etiquette are the two sections with a moderate infection risk.

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