

Status Of Knowledge Of Dental Nurses In Medan On The Use Of Standard Precautions For Infection Prevention During Management Of Odontogenic Infections

Rahmi Syaflida¹, Angga Apriyanto Sinaga²

¹(Department of Oral and Maxillofacial Surgery, University of North Sumatra, Indonesia)

²(Department of Oral and Maxillofacial Surgery, University of North Sumatra, Indonesia)

Abstract:

Background: Odontogenic surgery can be a source of infectious agents through bleeding and drainage. To ensure proper infection control, it is important that dental nurses have the knowledge, skills, and adherence to cross infection and standard precaution. This study aimed to obtain a description of status of knowledge and behavior of dental nurses regarding the implementation of standard precaution to prevent cross infection during management of odontogenic infection surgery.

Materials and Methods: This kind of study is descriptive quantitative research using survey method with cross sectional approach. The survey was conducted in Kota Medan and the data was analyzed univariately with percentages categorized into three levels of knowledge as follows: high, moderate, low knowledge of cross-infection and standard precautions and three levels of behavior as follows: highly compliant, fairly compliant, and less compliant in applying standard precautions during odontogenic infections surgery.

Results: There are 98.63% nurses have good knowledge of cross-infection and standard precautions, followed by 90.41% nurses are very compliant in applying standard precautions during management of odontogenic infection.

Conclusion: Majority of dental nurses in Medan have good knowledge of cross-infection and standard precautions and show a high level of compliance in applying standard precautions during the management of odontogenic infections.

Key Word: status of knowledge, compliance, standard precaution, dental nurses.

Date of Submission: 24-09-2023

Date of acceptance: 04-10-2023

I. Introduction

Odontogenic infections are infections originating in teeth and/or their supporting tissues caused by the activity of multiple microorganisms, including aerobic and anaerobic bacteria, which can spread to other areas of the body and are often fatal. The most common aerobic bacteria are *Streptococcus viridans* and the most common anaerobic bacteria are *Bacteroides* spp., *Prevotella*, and *Peptostreptococcus*¹. Most cases of oromaxillofacial surgery are due to odontogenic infection (79.31%)².

Odontogenic infection surgery is an invasive treatment. Either elective or emergency (cito) surgery, both carry a risk transmission of infection. WHO data showed that 5%-34% of all nosocomial infection are wound surgery infection (ILO)³. Some of them can be caused by the cellular activity of pathogenic microbes such as bacteria and viruses like HIV, Hepatitis B, Hepatitis C, Herpes, and Tuberculosis⁴⁻⁶. This is called cross infection which is a phenomenon of infectious agents transmission that occurs among patients, operators, and environment^{4,5,7}.

Shigehiro Shimoji discovered that 42.9% nurses at Matsumoto Dental University were aerosol-infected, and 14.3% were aerosol-infected through the conjunctiva⁸. Later, in France, 18.720 nurses were found to have needlestick injuries⁴. In addition, cases of cross infection was also found in two hospitals in Indonesia, which increase from 0.37% to 1.47% from 2010 to 2011, and Adam Malik Hospital Medan, where cross-infection increased in 2010 which infection recorded cases of infection by 5.6%⁹.

In addition, dental nurses also play a role in preventing cross infection during treatment, before, during, and after surgery³. The ability of pathogenic microbes to move from one location to another is a strong reason, especially in surgeries involving odontogenic infections, for dental nurses to ensure infection control goes well as part of successful treatment. Therefore, skills and compliance of application of procedure called standard precaution are as important as knowledge aimed at protecting clinician, patients, and environments from potential risk of cross infection from known or unknown sources of infection¹⁰.

The purpose of this study was to collect data from dental nurses in Kota Medan describing their status of knowledge about cross infections and standard precautions, and their level of compliance in application of

standard precaution procedures during the management of odontogenic infections. This data can be used as a comparison with the knowledge level of dentists, given that there was no previous survey of dental nurses in Kota Medan.

II. Material And Methods

The type of this research was descriptive quantitative research which aimed to obtain the status of knowledge of dental nurses in Kota Medan in terms of knowledge and behavior described in percentage and frequency by using questionnaire to collect the data. This research was conducted from April 2021 to June 2021.

Study Design: Descriptive study with a survey method

Study Location: This study was carried out in Kota Medan, Indonesia.

Study Duration: April 2021 – June 2021.

Sample size: 73 dental nurses.

Sample size calculation: This study used a proportion estimation formula as a measuring instrument in calculating the sample size, with confidence level of 95%, and the proportion of 50% (0.5) resulting in the sample size of 73 people.

Subjects & selection method: The subject was dental nurses who worked in Kota Medan. The sampling technique used in this study was purposive sampling method as samples were selected based on certain criteria.

Inclusion criteria:

1. Dental nurses who have a dental nursing education background
2. Dental nurses who have active registration certificate
3. Dental nurses who are still actively practicing
4. Dental nurses who are a member of Indonesian Dental and Oral Therapists Association

Exclusion criteria:

1. Dental nurses who are already retired
2. Dental nurses who is on annual leave status
3. Dental nurses who did not fill out the questionnaire completely or did not fill it out at all

Procedure methodology

The research proposal has been approved by Research Ethics Committee of Health Research of North Sumatera University (No. 463/KEP/USU/2021). All participants filled informed consent form containing a brief description of the study and pre-participation goals.

The instrument used to collect the data was an online questionnaire, in the form of closed question. All questions on the questionnaire have passed the validity and reliability test. The knowledge questionnaire consists of 14 statements with correct and incorrect answer choices. Respondents who answer correctly receive a score of 1 and score 0 to those who answer incorrectly. The behavioral questionnaire consists of 14 statements which is divided into 4 variables, such as hand hygiene, personal protective equipments, management of patient care tools, and handling needle and sharps with Likert scale answer choices. For positive statements, behavioral value “Always” contains a score of 4, “Often” a score of 3, “Sometimes” a score of 2, and “Never” a score of 1, but a negative statement, “Always” has a score of 1, “Often” a score of 2, “Sometimes” a score of 3, and “Never” score 4.

Statistical analysis

The data was analyzed univariately presented in terms of percentage and frequency to determine the status of knowledge and compliance of dental nurses regarding cross infection and standard precautions with high, moderate, and less on knowledge questionnaire, while on behavioral questionnaire: very obedient, fairly obedient, and less obedient. Grouping of respondents based on the Notoatmodjo's scale: good/highly compliant (score >76% - 100%), moderate/fairly compliant (score 56% - 75%), and less/less compliant (score <75%).

III. Result

The results of this study consist of the frequency distribution of dental nurses characteristics, the distribution of the results of dental nurses knowledge of cross-infection and standard precautions, and the distribution of research results of dental nurses adherence to preventive measures. Standard precautions during treatment of odontogenic infections are presented in Table 1, 2, and 3 respectively.

Of the 73 dental nurses who participated in this study, most of the respondents were over the age of 29 (52.05%), 65 were female (89.04%), and had never attended standard precaution training was up to 63 (86.30%). Respondents' knowledge of cross infection and standard precaution was mostly in the “high” category of 72

people (98.63%), while respondents' behaviour applying standard precaution procedure during odontogenic infection treatment was also mostly in highly compliant category of 66 people (90,41%) followed by 7 respondents (90.41%) of fairly compliant category.

Table no 1: Characteristic distribution of dental nurses (n=73).

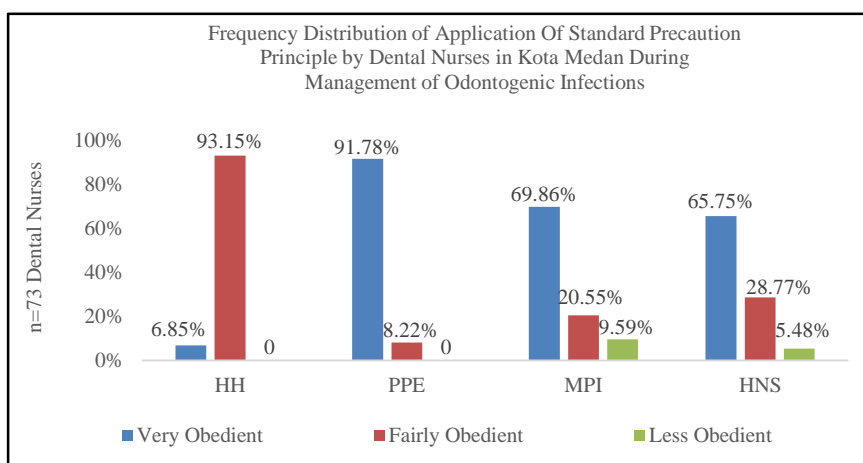
Characteristic	n	%
Age		
<29	35	47.95
≥29	38	52.05
Gender		
Male	8	10.96
Female	65	89.04
Standard Precaution Training		
Never followed	63	86.30
One time	9	12.33
More than one time (>1x)	1	1.37

Table no 2: Level of knowledge of respondents about cross-infection and standard precautions

Category	n	%
High	72	98.63
Moderate	1	1.37
Less	0	-
Total	73	100

Table no 3: Degree of compliance of respondents to the use of standard precautions during treatment of odontogenic infections based on Notoatmodjo's scale

Category	n	%
Highly compliant	66	90.41
Fairly compliant	7	9.59
Less compliant	0	-
Total	73	100



* HH = Hand Hygiene; PPE = Personal Protective Equipment; MPI = Management of Patient Care Instruments; MSS = Handling Needle and Sharps

The standard precautions for each subvariable by dental nurses in Kota Medan during treatment of odontogenic infections are as follows: The majority of categories were “fairly obedient” with the handwashing principle 68 respondents (93.15%), was “very obedient” with the categories of PPE. Handling of patient care equipment was in the “very obedient” category of 51 respondents (69.86%), while most of the principles of handling needle and sharps were in the “very compliant” category of 48 respondents (65.75%).

IV. Discussion

Knowledge is an important domain that determines human behavior. Notoatmodjo, in his book entitle Pendidikan dan Perilaku, defines knowledge as the result of knowledge involving the perception of objects by sight, hearing, smell, touch, and taste¹¹. The results of this study indicate that the majority of respondents have good level of knowledge of cross infection and standard precaution (98.63%). This indicates that most of respondents were well informed about cross infection and standard precaution. This study is consistent with Eva

Marsepa's findings that her 27 out of 45 nurses (60%) had adequate knowledge of surgical site infection (ILO) prevention¹². Some factors that may influence this result are education, mass media, environment, and socioeconomy¹¹.

Principle of Hand Washing

Surfaces of the hands can be carriers of many types of pathogenic microorganisms, making hand washing a simple but important step in preventing the transmission of microorganisms from one place to another. Some of these principles are hand washing after contact with patient secrets such as blood, saliva or pus, and surgical hand washing before surgery. According to our survey, it was found that, majority of respondents are in fairly obedient. In other words, dental nurses have not yet fully adopted the principle of handwashing. This differs from a study by Ria Risti Komala Dewi who found that 69.1% of nurses belong to non-compliant category¹³. This difference was due to facility availability, motivation, supervision, and so on.

Principle of Personal Protective Equipment

Personal protective equipment (PPE) provides physical protection to clinicians, including dental nurses, and isolates the body from sources of infection such as blood and saliva splashes, broken skin, air, and other unknown sources of infection. This principle is mandatory. In particular, treatment leads to bleeding and hospital discharge. In this survey, 67 respondents (91.78%) were highly compliant and 6 respondents (8.22%) were fairly obedient. This differs from Tien Zubaidah's study, which found that 28 put of 48 nurses (58.33%) ignored this principle¹⁴.

Principle of Managing Patient Care Tools

Another equally important part is managing patient care tools. Dental nurses also have role and responsibility to ensure the sterility of instruments. Therefore, the four main steps that need to be performed are decontamination, cleaning, sterilization, and storage⁷. In this study, 51 people (69.86%) were highly compliant about having available tools such as waive the use of rubbing ash to clean tools and perform the tool decontamination step, followed by 15 respondents (20.55%) in the fairly obedient category, and 7 respondents (9.59%) in less obedient category. These results are consistent with study by Hajjul Kamil which 38 nurses which 23 people (60.5%) were in the good category¹⁵.

Principle of Handling Needles and Sharp Objects

Needlestick injuries are common inpatient strains. Some ways to prevent this are to use heavy gloves when cleaning the tool and use the "single hand recapping method" when needle closure is needed.¹⁶ According to the results of this survey, there are still dental nurses who reseal needles with both hands without thick gloves, 4 respondents (5.48%). The results of this study are consistent with study by Hajjul Kamil which also encountered nurses who tried to close used a used needle cover but did not use the one-handed closing method¹⁵.

V. Conclusion

Majority of dental nurses in Kota Medan have good knowledge of cross-infection and standard precautions and show a high level of compliance in applying standard precautions during the management of odontogenic infections. For further evaluation, it is advisable to do observational research to obtain the actual condition due to limitations of this study to examine their daily implementation of standard precaution.

References

- [1]. Hupp JR, Ellis E, Tucker MR. Contemporary Oral And Maxillofacial Surgery 7th. 7th Ed. Vol. 7, Elsevier. Elsevier; 2019. 318 P.
- [2]. IF B, JC H. A Textbook Of Advanced Oral And Maxillofacial. Kalantar MHM, Editor. Rijeka: Intech; 1984. 341 P.
- [3]. Haryanti L, Pudjiadi AH, Ifran EKB, Thayeb A, Amir I, Hegar B. Prevalens Dan Faktor Risiko Infeksi Luka Operasi Pasca-Bedah. *Sari Pediatr*. 2016;15(4):207.
- [4]. D'Affronte L, Platia CL. Infection Control In The Dental Office. Depaola LG, Grant LE, Editors. Cham: Springer Nature Switzerland AD; 2020. 9–21, 77-102,106 P.
- [5]. Mulyanti S, Putri MH. Pengendalian Infeksi Silang Di Klinik Gigi. Hanif L, Editor. Jakarta: EGC; 2011. 1–6, 7–27, 29–79 P.
- [6]. Lugito MDH. Kontrol Infeksi Dan Keselamatan Kerja Dalam Praktek Kedokteran Gigi. *J PDGI*. 2013;62(1):24–30.
- [7]. Depkes RI. Pedoman Pelaksanaan Kewaspadaan Universal Di Pelayanan Kesehatan. Anonim, Editor. Jakarta, Perhimpunan Pengendali Infeksi Indoneia. Jakarta: Departemen Kesehatan; 2003. 1–3, 9, 57 P.
- [8]. Shimoji S, Ishihama K, Yamada H, Okayama M, Yasuda K, Shibutani T, Et Al. Occupational Safety Among Dental Health-Care Workers. *Adv Med Educ Pract*. 2010;1:41–7.
- [9]. Aditya Christian Hutagaol, Hesti Lestari JMLU. Faktor-Faktor Penguat Perilaku Yang Berhubungan Dengan Kepatuhan Perawat Gigi Dalam Penerapan Standard Precaution Di Poliklinik Gigi Dan Mulut Di Rumah Sakit Kota Manado. 2016;47–63.
- [10]. Dachirin W. Analisis Kepatuhan Perawat Dalam Melakukan Kewaspadaan Standar Mencegah Healthcare Associated Infections (Hai's) Di Rumah Sakit Islam NU Demak. Universitas Negeri Semarang; 2019.
- [11]. Natoatmodjo S. Pendidikan Dan Perilaku Kesehatan. Jakarta: Rineka Cipta; 2003. 121–123 P.
- [12]. Marsepa E, Gunawan E, Musesari U. Tingkat Pengetahuan Dan Sikap Perawat Dengan Tindakan Pencegahan Infeksi Luka Operasi Di Ruang Rawat Bedah RSU Kabupaten Tangerang. *J Ilm Kesehat*. 2019;8(1):1–20.

- [13]. Kesehatan J, Khatulistiwa M, Cuci P, Di T, Ade R, Djoen M. Faktor Determinan Kepatuhan Perawat Dalam Melakukan Cuci Tangan Di RSUD Ade Muhammad Djoen Sintang. *J Kesehat Masy Khatulistiwa*. 2017;4(3):232–7.
- [14]. Zubaidah T, Arifin A, Jaya YA. Pemakaian Alat Pelindung Diri Pada Tenaga Perawat Dan Bidan Di Rumah Sakit Pelita Insani. *J Kesehat Lingkung J Dan Apl Tek Kesehat Lingkung*. 2015;12(2):291.
- [15]. Kamil H. Penerapan Prinsip Kewaspadaan Standar Oleh Perawat Pelaksana Di Ruang Rawat Inap Penyakit Bedah RSUDZA Banda Aceh. *Idea Nurs J*. 2011;2(1):1–11.
- [16]. Jayakumar P, Maruthupandian D, Senthilkumar S. Tip To Hub Vertical Recapping An Alternative Method To One Hand Recapping Techinique. *Int J Adv Res*. 2016;11(4):1749–53.