



## Infection Prevention And Control Of Dentistry Students In Tooth Extraction At Dental And Oral Hospital

Authors:

*Dwi Windu Kinanti Arti*<sup>1\*</sup>, *Divi Talitha Olivia Sandra*<sup>2</sup>, *Ulfa Nurullita*<sup>3</sup>

<sup>1</sup>Faculty of Dentistry Universitas Muhammadiyah Semarang;

<sup>2</sup>Dentistry Student of Universitas Muhammadiyah Semarang;

<sup>3</sup>Faculty of Public Health Universitas Muhammadiyah Semarang;

Corresponding Email: \*[drg.dwiwindu@unimus.ac.id](mailto:drg.dwiwindu@unimus.ac.id), [divitalitha.os@gmail.com](mailto:divitalitha.os@gmail.com),  
[ulfa@unimus.ac.id](mailto:ulfa@unimus.ac.id)

### About the Author

1. 1st Author : (drg. Dwi Windu Kinanti Arti, M.MR)  
Affiliation : (Faculty of Dentistry Universitas Muhammadiyah Semarang).  
Mailing address : (Pondok Babadan Baru, Jl. Serasi II, D. 66 kel. Beji, Kec. Ungaran Timur. Kab. Semarang)  
Email of author : ([drg.dwiwindu@unimus.ac.id](mailto:drg.dwiwindu@unimus.ac.id))  
Orcid ID : <https://orcid.org/0009-0008-9968-7303>  
Google Scholar URL : <https://scholar.google.com/citations?user=GQbLoTAAAAAJ&hl=en>  
Phone number : 0857-4025-0984
- 2nd Author : (Divi Talitha Olivia Sandra)  
Affiliation : (Faculty of Dentistry Universitas Muhammadiyah Semarang).  
Mailing address : (Perumahan Graha Wahid Cluster Sydney Blok C-21, Kelurahan Sambiroto, Kecamatan Tembalang, Kota Semarang, Provinsi Jawa Tengah, Kode Pos 50276)  
Email of author : ([divitalitha.os@gmail.com](mailto:divitalitha.os@gmail.com))  
Orcid ID : -  
Google Scholar URL : -  
Phone number : 085743663092
- 3rd Author : (Ulfa Nurullita, S.KM, M,Kes)  
Affiliation : (Faculty of Public Health Universitas Muhammadiyah Semarang).  
Mailing address : (Jl. Sakura Garden Nomor 5, Mega Residence, Pudak Payung, Kec Banyumanik, Kota Semarang, Jawa Tengah 50265)  
Email of author : ([ulfa@unimus.ac.id](mailto:ulfa@unimus.ac.id))  
Orcid ID : 0000-0001-9788-8699  
Google Scholar URL : <https://scholar.google.com/citations?user=Tqg5Y30AAAAAJ&hl=id&oi=ao>  
Phone number : 0812-2936-553

## ABSTRACT

*Dental practice has risk becoming an entry point for infectious diseases in dental health facilities. Tooth extraction is an invasive procedure and it is necessary to do Infection Prevention and Control (IPC). The problems in implementation of IPC are not washing hands optimally, not using face shield, and the implementation of IPC in RSGM Unimus are not yet evaluated routinely. This research is descriptive study with cross sectional approach to describe the IPC behavior by dental students in tooth extraction at RSGM Unimus. Respondents in this study were 38 dental students at RSGM Unimus performed tooth extraction. The variables studied were age, gender, years of practice, habits in maintaining hand hygiene, use of PPE, handling of sharp objects, and safe injection practices. The sampling technique are accidental sampling. Most of the respondents were female, aged 24 years, and had practice period of 19-24 months. The ability to maintain hand hygiene is good for 36 respondents (94,7%), the use of PPE is good for 23 respondents (60,23%), handling sharp objects is good for 33 respondents (86,8%), and safe injection practices is good for 34 respondents (89,5%). In conclusion, IPC behavior by dental students at RSGM Unimus has been good.*

*Keywords: Infection Prevention and Control; Dental Student; PPE; Tooth Extraction; Dental and Oral Hospital*

## ABSTRAK

*Tindakan praktik kedokteran gigi berisiko menjadi jalur masuk penyakit infeksi di fasilitas kesehatan pelayanan gigi. Ekstraksi gigi adalah tindakan invasif sehingga perlu dilakukan Pencegahan dan Pengendalian Infeksi (PPI). Permasalahan dalam penerapan PPI adalah cuci tangan belum maksimal, tidak menggunakan face shield, serta belum dilakukan evaluasi rutin terhadap pelaksanaan PPI di RSGM Unimus. Penelitian ini bertujuan untuk mengetahui gambaran tindakan PPI oleh mahasiswa program profesi dokter gigi pada tindakan ekstraksi gigi di RSGM Unimus. Penelitian ini merupakan penelitian deskriptif cross sectional dengan responden penelitian mahasiswa program profesi dokter gigi RSGM Unimus yang melakukan ekstraksi gigi yaitu sebanyak 38 responden. Variabel yang diteliti adalah usia, jenis kelamin, lama praktik, kebiasaan menjaga kebersihan tangan, penggunaan APD, penanganan benda tajam, dan praktik injeksi aman. Teknik sampling menggunakan accidental sampling. Responden paling banyak adalah perempuan, usia 24 tahun, dan lama praktik 19-24 bulan. Kebiasaan menjaga kebersihan tangan dengan kategori baik sebanyak 36 responden (94,7%), penggunaan APD kategori baik sebanyak 23 responden (60,23%), penanganan benda tajam kategori baik oleh 33 responden (86,8%), dan praktik injeksi aman kategori baik sebanyak 34 responden (89,5%). Kesimpulan penelitian ini adalah tindakan PPI oleh mahasiswa program profesi dokter gigi di RSGM Unimus sudah baik.*

*Kata kunci: Pencegahan dan Pengendalian Infeksi; Mahasiswa Program Profesi Dokter Gigi; APD; Ekstraksi Gigi; Rumah Sakit Gigi Dan Mulut*

## INTRODUCTION

The dental practice has risk of becoming an entry point for infectious diseases (Jain, Manish; Mathur, Aditi; Mathur, Anmol; Mukhi, Pravin U; Ahire, Mahesh; Pingal, 2017). Infection can spread in a health facility between patient and dental health worker. The risk of infection can be a problem for dentists, dental nurses, and the dental students who practice in dental health care facilities (AL-Essa & AlMutairi, 2017). Dental and Oral Hospital is a health facility that must strive for patient safety and reduce the risk of Healthcare Associated Infection (HAIs) by conducting infection prevention and control programs (IPC) (Permenkes, n.d.). Efforts to protect and prevent dental health workers from spreading infection include standard precautions such as applying cough and sneezing etiquette, maintaining hand hygiene, managing sharps safety, using PPE, safe injection practices, sterilizing instruments, cleaning and disinfecting surfaces environment so that dentists, dental nurses, dental professional program students, and patients are protected (CDC, 2016).

The 2018 RISKESDAS data shows the percentage of teeth lost due to extraction or loss of 19% (RISEKDAS, 2018). The number of permanent tooth extractions carried out in all working areas of the Semarang Health Center is 8,355 extractions (Riskesdas, 2018). Tooth extraction is an invasive procedure so it has a high risk of transmitting infection (Lumunon et al., 2019).

The previous studies have examined the IPC on operators, patients, and instruments for scaling and found that the IPC was carried out 50.1% (Ramadhani et al., 2015). Another study on IPC behavior before, during, and after tooth extraction with dentists as the subject, it was found that the IPC in the Dental Polyclinic of the Puskesmas was not yet maximum (Lumunon et al., 2019) Research describing hand hygiene, PPE, waste and sharps instruments, linen, environmental management, equipment, employee protection, and ethics found that infection prevention by program students was quite good (Sarwono, 2019)

This study has differences in variables and subjects with previous studies. The subjects of this study were students of the dental profession program at Dental and Oral Hospital Muhammadiyah University of Semarang who performed tooth extraction with research variables that is individual characteristics including age, gender, and length of practice, habits of maintaining hand hygiene, use of PPE, handling of sharp objects, and safe injection practices.

Problems that often occur in the application of IPC when carrying out treatment are hand washing that still not optimal, forgetting to use eye protection or face protection, and the implementation of IPC has not been routinely evaluated. The purpose of this study was to describe the IPC behavior by students of the dental profession program on tooth extraction at the Dental and Oral Hospital.

## **METHOD**

This research is a descriptive study with a cross sectional design. This research was conducted in April-June 2022 at the Integration Clinic of Dental and Oral Hospital Muhammadiyah University of Semarang located at Kedungmundu Street Number 22, Sendangmulyo, Tembalang, Semarang City, Central Java 50273.

The population of this study were all dental extractions performed by students of the dental profession program at Dental and Oral Hospital Muhammadiyah University of Semarang with an average of 62 treatments per month. The research sample was calculated using the Lemeshow formula and obtained a sample size of 38 treatments. The sampling technique was done using accidental sampling.

The data collection of this research was conducted through interviews for data on age, gender, and practice period, as well as observations to observe the IPC including the habit of maintaining hand hygiene, use of PPE, handling sharp objects, and safe injection practices by dental professional program students who perform tooth extraction procedures. This research has been approved by the Health Research Ethics Commission Faculty of Public Health, Muhammadiyah University of Semarang with No: 625/KEPK-FKM/UNIMUS/2022.

## **RESULTS AND DISCUSSION**

### **1. Characteristics of Research Respondents**

The results of data processing about characteristics of respondents in this study are presented in Table 1.

Variable	Frequency	Percentage (%)
Age		

22 years old	3	7,9
23 years old	4	10,5
24 years old	16	42,1
25 years old	9	23,7
26 years old	6	15,8
Total	38	100
Gender		
Male	16	42,1
Female	22	57,9
Total	38	100
Practice Periods		
7-12 months	4	10,5
13-18 months	3	7,9
19-24 months	15	39,9
25-30 months	6	15,8
31-36 months	10	26,3
Total	38	100

Tabel 1. Characteristics of Research Respondents

Table 1 shows that most of the respondents aged 24 years as many as 16 people (42.1%), female gender as many as 22 people (57.9%), and having a practice period of 19-24 months as many as 15 respondents (39.9%). The results of this study are in line with research on dentists in Pekanbaru City which stated that most dentists were female (83.3%). This is because the dental faculty is dominated by female and there are different behavioral factors between male and female, where female have a tendency to take care of other people than male. Female tend to respond to patient concerns with more empathy and less rushed in communicating with patients (O. Dewi, 2020).

The majority of respondents in this study belong to the late teens where a person begins to develop to enter adulthood. Late teens tend to have self-confidence, belief in their abilities, persistent to achieve goals, open to new experiences, and not easily give up when facing of obstacles. (Putri & Rustika, 2017) Getting older will make a person have more experience and knowledge and this will affect their behavior (I. P. Dewi et al., 2019).

The practice periods for students of the dental profession program is normally taken within 24 months. The results of this study indicate that the majority of respondents are in the final stage of the study period, and at this stage students of the dental profession program already have sufficient experience regarding IPC behavior. Working experience can be obtained from the period of work, where the longer their works, the more experience they will get and they tends to be careful because they understands the risks (Putri & Rustika, 2017).

## 2. Habit of Maintaining Hand Hygiene

Habit of maintaining hand hygiene in this research measured by the WHO reference of hand washing before and after handling patients by observing 10 items in the observation sheet. If maintaining hand hygiene is categorized as good or not good, the results are shown in Diagram 1.

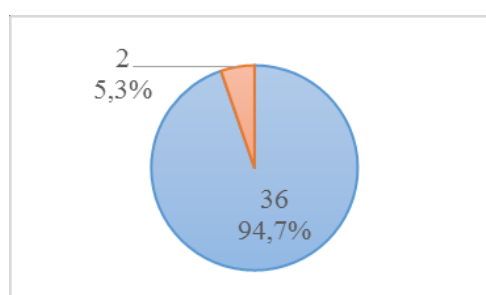


Diagram.1 Habit of Maintaining Hand Hygiene

All respondents have a good habit of maintaining hand hygiene before handling patients (100%). After handling the patient, the habit of maintaining hand hygiene was not optimal because there were steps that missed in hands interlocking for rub inner side of finger, rubbing the left thumb rotating in the grip of the right hand and conversely, and rubbing by rotating the tips of the right fingers in the palm of the left hand and conversely. Hand washing needs to be done according to the right steps to clean, reduce, or suppress pathogenic microorganisms on the hands to prevent cross-contamination. If the hand hygiene is still not optimal, there is a possibility that microorganisms are still attached and trapped on the hands. There is a study which states that there is a strong relationship between hand washing using standard operating procedures with the incidence of nosocomial infections (Windyastuti, Ni Kadek Ayu Widyastuti, 2019).

Students of the dental profession program with female gender in this study were the most obedient in maintaining hand hygiene habits. According to the researcher's observations, this is because women are more patient in doing detailed and time-consuming work, and have a good awareness that washing hands with improper steps will cause the risk of infection transmission. Another study stated that female respondents generally have more knowledge and behavior in maintaining hand hygiene compared to male respondents (Suen et al., 2019).

Students of the dental profession program with practice periods between 13-30 months in this study were all obedient in the habit of maintaining hand hygiene, while the less obedient were mostly in students with a practice period of 7-12 months.

### 3. Use of PPE

The use of PPE in this study was measured with level 3 PPE used by students of the dental profession program, by observing 6 items in the observation sheet. If the use of PPE is categorized into good and not good, the results are shown in Diagram 2.

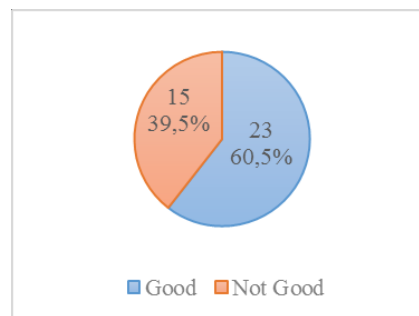


Diagram.2 Use of PPE

This study shows that there are still students of the dental profession program that do not use eye or face protection, as many as 15 respondents (39.5%). The results of another study stated that the percentage of respondents who used eye or face protection was only 5% (Samad et al., 2017). Research on the application of disease transmission prevention protocols in dental practice states that the majority of respondents have used PPE but still lacking in the use of goggles or face shields (Rahmah et al., 2022)

Protective eyewear or face shields should be worn when doing treatment for patients. Face shields are effective in reducing exposure to infectious particles. Goggles provide very effective protection for the eyes against splashes, but often create mist on the glass surface which affects visibility. The combination of protective eyewear and the right mask can provide good protection (Rutkowski et al., 2020).

The use of PPE with good categories in this study was mostly done by male respondents. According to the researcher's observations, that was because male respondents felt there was no problem and still felt comfortable when using PPE, while female respondents felt uncomfortable because the size of the PPE used did not match with the size of their body or face.

Students of the dental profession program with a practice period of 7-12 months are all in the good category in the use of PPE, while the lowest percentage in the use of PPE is carried out by students with a practice period of 25-30 months.

#### 4. Handling of Sharp Objects

The handling of sharp objects is measured by the actions of students of the dental profession program on the instruments and sharp objects used during tooth extraction, by observing 3 items in the observation sheet. If categorized into good and not good, the results are shown in Diagram 3.

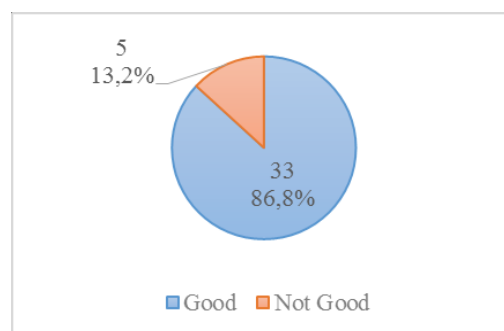


Diagram.3 Handling of Sharp Objects

The results of this study indicate that in handling sharp objects, there are still dental professional program students who do not control work practices to prevent accidents and still close the needle using the two-handed technique. This can increase the needle sticks injury to the operator. Contaminated needles may contain pathogenic microorganisms and viruses, thus increasing the risk of cross-infection in dental practice.

Control of work practices to prevent accidents needs to be carried out, by closing the syringe with the one-handed technique, using a cotton roll or plastic cup to cover the tip of the scaler and dental bur, and administering anesthetic injection by retracting the mucosa using an instrument (Dukka et al., 2021). Closing the needle with one hand (the scoop technique) or the needle block device or a combination of both is considered a safe technique, while the use of both hands to cover the needle is considered an unsafe practice (Siddiqi et al., 2017).

Students of the dental profession program with female gender in this study were mostly in the good category in handling sharp objects. Students of the dental profession program with practice period of 19-24 months are all in the good category in handling sharp objects, while the lowest percentage in handling sharp objects is carried out by students of the dental profession program with a practice period of 13-18 months.

#### 5. Safe Injection Practices

The safe injection practices in this study was measured by the actions of students when doing injections during tooth extraction in the safest way to protect patients observing 4 items in the observation sheet. If categorized into good and not good, the results are shown in Diagram 4.

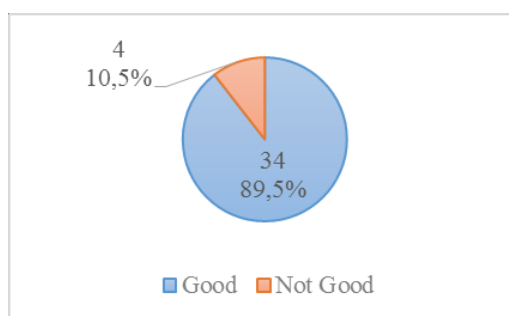


Diagram.4 Safe Injection Practices

Most of the students of dental profession program have a good category for safe injection practices. Total of 4 respondents or 10.5% did not use new needles and syringes when giving additional doses to the same patient.

Use of new needles and syringes when give additional doses for the same patient need to be increased. The use of the same needle and syringe to give additional doses is not in accordance with the rules in the IPC. After the syringe used for injection of anesthetic into a patient, the needle and the inside of the syringe are considered contaminated and must be disposed in an appropriate manner. Needles and syringes can also become contaminated with microorganisms in the work area when the operator opens and closes the syringe repeatedly.

The practice of safe injection in this study was mostly carried out by male students of the dental profession program. Students of the dental profession program with practice period of 13-18 months and 25-30 months are all in good category for safe injection practices, while the lowest percentage is carried out by students with 7-12 months of practice.

## 6. Overview of IPC Behavior by Gender and Practice Periods

The IPC behavior by students of the dental profession program at Dental and Oral Hospital Muhammadiyah University of Semarang based on gender showed that all female respondents (100%) had carried out the habit of maintaining good hand hygiene. The use of PPE which is included in the good category mostly done by male respondents, which is 62.5%. Furthermore, in terms of handling sharp objects which are included in the good category is majority carried out by female respondents, where only 9.1% of female respondents handle sharp objects poorly. Male respondents with a good category in safe injection practices have the largest percentage, as many as 93.8%.

Students of the dental profession program with male gender get the highest percentage in the use of PPE and safe injection practices. The female students of the dental profession program in this study were more obedient to the habit of maintaining hand hygiene and handling sharp objects.

The IPC behavior by students of the dental profession program at Dental and Oral Hospital Muhammadiyah University of Semarang based on the practice period shows that all respondents (100%) with a practice period of between 13-30 months have carried out the good habit of maintaining hand hygiene. The use of PPE in the good category was carried out by all respondents (100%) who had a practice period of 7-12 months. All respondents (100%) with a practice period of 19-24 months are in the good category in handling sharp objects. The practice

of safe injection in the good category was carried out by all respondents (100%) with a practice duration of 13-18 months and 25-30 months.

Students of the dental profession program with practice period of 7-12 are all obedient in the use of PPE, but get the lowest percentage in maintaining hand hygiene and safe injection practices. Respondents with a practice period of 13-18 months were entirely obedient in the habit of maintaining hand hygiene and safe injection practices, but got the lowest percentage in handling sharp objects. Respondents with a practice period of 19- 24 months were all good at maintaining hand hygiene and handling sharp objects. Respondents with a practice period of 25-30 months were entirely obedient in maintaining hand hygiene, but got the lowest percentage in the use of PPE. The longer works, the more experience and insight they will have, so their performance will be better. However, it is possible that there are behaviors or habits that decreased with the longer practice period. This non-compliance behavior can be influenced by several factors, such as forgetting to do, feeling lazy, or not having enough time.

## CONCLUSIONS AND SUGGESTIONS

The IPC behavior by students of the dental profession program at the Dental and Oral Hospital Muhammadiyah University of Semarang has been good in maintaining hand hygiene, using PPE, handling sharp objects, and practicing safe injections. IPC behavior that have not been carried out properly are washing hands after handling patients not yet according to the recommended steps, not using eye or face protection, not controlling work practices to prevent accidents, still closing needles using the two-handed technique, and not using new needles and syringes when giving an additional dose to the same patient. The limitations of this research is does not analyze the relationship between the characteristics of the respondents and the IPC behavior by students of the dental profession program.

## Acknowledgment

Thank you to the management and employees at the Dental and Oral Hospital of Universitas Muhammadiyah Semarang who have provided the opportunity to conduct research..

## REFERENCES

- AL-Essa, N. A., & AlMutairi, M. A. (2017). To what extent do dental students comply with infection control practices? *Saudi Journal for Dental Research*, 8(1–2), 67–72. <https://doi.org/10.1016/j.sjdr.2016.10.003>
- CDC. (2016). Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care. *US Dept of Health and Human Services*.
- Dewi, I. P., Adawiyah, W. R., & Rujito, L. (2019). Analysis of Adherence Level of Using Personal Protective Equipment for Dentist Profession Students at Unsoed Dental and Oral Hospital. *JEconomic Journal for Business and Accountants (JEBA)*, 21(4), 1–10. <http://jp.feb.unsoed.ac.id/index.php/jeba/article/viewFile/1541/1550>
- Dewi, O. (2020). *Konsep Limbah Medis dalam Layanan Kesehatan Gigi* (1st ed.). CV. Global Aksara Pres.
- Dukka, H., Byrd, P., Qian, C., Baughman, G., Butt, S., & Rai, S. N. (2021). Occupational percutaneous injuries and exposures in a dental teaching environment: A 10-year report. *Journal of Dental Education*, 85(11), 1729–1738. <https://doi.org/10.1002/jdd.12731>
- Jain, Manish; Mathur, Aditi; Mathur, Anmol; Mukhi, Pravin U; Ahire, Mahesh; Pingal, C. (2017). Qualitative and quantitative analysis of bacterial aerosols in dental clinical settings: Risk exposure towards dentist, auxiliary staff, and patients. *Journal of Family Medicine and Primary*

- Care*, 6(2), 169–170. <https://doi.org/10.4103/jfmipc.jfmipc>
- Lumunon, N. P., Wowor, V. N. S., & Pangemanan, D. H. C. (2019). Pencegahan dan Pengendalian Infeksi Silang pada Tindakan Ekstraksi Gigi di Poli Gigi Puskesmas Kakaskasen Tomohon. *E-GIGI*, 7(1), 34–43. <https://doi.org/10.35790/eg.7.1.2019.23311>
- Permenkes, R. I. (n.d.). Peraturan Menteri Kesehatan Republik Indonesia Nomor 1691/MENKES/PER/VIII/2011. 2011.
- Putri, P. N. A., & Rustika, I. M. (2017). Peran Pola Asuh Autoritatif, Efikasi Diri, Dan Perilaku Prosocial Terhadap Kesejahteraan Psikologis Pada Remaja Akhir Di Program Studi Pendidikan Dokter Gigi Fakultas Kedokteran Universitas Udayana. *Jurnal Psikologi Udayana*, 4(1), 151–164. <https://doi.org/10.24843/jpu.2017.v04.i01.p16>
- Rahmah, F., Bhakti Purnamasari, C., Muthi, N., Program Studi Kedokteran Gigi, ah, Kedokteran, F., & Mulawarman Program Studi Kedokteran Gigi, U. (2022). Gambaran Penerapan Protokol Pencegahan Penularan Covid-19 Pada Praktik Dokter Gigi di Kota Samarinda. *Mulawarman Dental Journal*, 2(1), 118–138.
- Ramadhani, W. R., Kepel, B. J., & Parengkuan, W. G. (2015). Tindakan Pencegahan Dan Pengendalian Infeksi Pada Perawatan Periodonsia Di Rumah Sakit Gigi Dan Mulut Pspdg Fk Unsrat. *E-GIGI*, 3(2). <https://doi.org/10.35790/eg.3.2.2015.9636>
- RISEKDAS. (2018). Laporan Nasional RISKESDAS 2018. In *Badan Penelitian dan Pengembangan Kesehatan*.  
[http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan\\_Nasional\\_RKD2018\\_FINAL.pdf](http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf)
- Riskesdas. (2018). Laporan Provinsi Jawa Tengah Riskesdas 2018. In *Kementerian Kesehatan RI*.
- Rutkowski, J. L., Camm, D. P., & El Chaar, E. (2020). AAID white paper: Management of the dental implant patient during the COVID-19 pandemic and beyond. *Journal of Oral Implantology*, 46(5), 454–466. <https://doi.org/10.1563/AAID-JOI-D-20-00316>
- Samad, R., Rawiyah, U., & Septiany, C. (2017). The frequency of wearing protective eyewear and face shield at educational hospital and public service Hospital in Makassar. *Journal of Dentomaxillofacial Science*, 2(2), 124. <https://doi.org/10.15562/jdmfs.v2i2.529>
- Sarwono, A. P. (2019). Gambaran Pelaksanaan Standar Operasional Prosedur Pengendalian Infeksi Oleh Mahasiswa Profesi di RSGM FKG Usakti Jakarta. *Jurnal PENA*, 33(2).
- Siddiqi, A., K Niazi, M. I., De Silva, H., Firth, N., Konthasingha, P., & Zafar, S. (2017). Percutaneous exposure incidents: a review of practice and awareness of current protocols at a Dental Faculty. *Oral Surgery*, 10(4), e80–e87. <https://doi.org/10.1111/ors.12282>
- Suen, L. K. P., So, Z. Y. Y., Yeung, S. K. W., Lo, K. Y. K., & Lam, S. C. (2019). Epidemiological investigation on hand hygiene knowledge and behaviour: A cross-sectional study on gender disparity. *BMC Public Health*, 19(1), 1–14. <https://doi.org/10.1186/s12889-019-6705-5>
- Windyastuti, Ni Kadek Ayu Widyastuti, M. K. (2019). Hubungan Kepatuhan Cuci Tangan Enam Langkah Lima Momen Dengan Kejadian Infeksi Nosokomial Di Ruang Mawar RSUD DR.H.Soewondo Kendal. *Jurnal Universitas Widya Husada Semarang*, 1(1), 118–128.