J Oral Res
research in oral sciences

Protocol

Compliance with biosecurity measures proposed in 2004, post SARS-CoV-2 outbreak, for dentistry students.

Cumplimiento de las medidas de bioseguridad propuestas en 2004, post brote de SARS-CoV-2, para estudiantes de odontología.

Diego Pérez Suazo.[1]
Consuelo Pontigo Inostroza.[1]
Catalina Sanhueza Monsalves.[1]
Sofía Sepúlveda Torres.[1]
Carlos Araya Vallespir.[2]

Affiliations:
[1]Facultad de Odontología, Universidad de Concepción, Chile.
[2]Departamento de Prevención y Salud Pública Odontológica Facultad de Odontología, Universidad de Concepción, Chile.

Corresponding author: Carlos Araya Vallespir. Facultad de Odontología, Universidad de Concepción, Chile. Avenida Roosevelt 1550, Concepción, Chile. Phone: (56-41) 2204232. E-mail: carlos.araya@udec.cl

Receipt : 06/23/2021
Acceptance : 08/25/2021

Cite as: Pérez Suazo D, Pontigo Inostroza C, Sanhueza Monsalves C, Sepúlveda Torres S & Araya Vallespir C. Compliance with biosecurity measures proposed in 2004, post SARS-CoV-2 outbreak, for dentistry students. J Oral Res 2021; S-1 (Congreso):1-5. Doi:10.17126/joralres.2021.040

INTRODUCTION.

During 2002, the first serious and easily transmissible disease of the 21st century emerged: Severe Acute Respiratory Syndrome (SARS), which probably originated in the province of Guangdong in southern China.[1]

The main way of transmission was through the spread of droplets, together with other minor secondary ways such as through close contact, fomites (an inanimate object that, once contaminated with a pathogen, can transfer the pathogen to a host), or even fecal contamination.[1]

One of the most puzzling aspects at the time was the spread of SARS among front-line health workers and dental staff, which are clearly at risk in a situation such as this, since they work very close to patients, employing procedures that generate droplets and aerosols.

In this context, it was necessary to use precautionary measures in addition to the universal biosafety standards to help control the spread of this highly contagious disease.

These included: Prior evaluation of the patient[2] (questions about travels, direct contacts, etc.); Specific measures for infection control[2] (intraoral x-rays performed only when necessary, avoid taking impressions and prefer the use of CAD/CAM), Adopt measures for droplet and aerosol control[2] (use of absolute isolation, among other actions).

In early March 2020, the Director General of the World Health Organization (WHO) stated that, because confirmed cases of COVID-19 outside of China had increased 13-fold since the initial outbreak, and the number of affected countries had tripled, this disease would be considered a pandemic.[3]

In dental care, the risk of contagion by COVID-19 significantly increases between patient and operator, due to the characteristics of dental care and procedures. Therefore it is necessary to implement strict biosecurity protocols[4] in all types of dental care and in all areas affected by the pandemic.

Taking the above into consideration, we pose the following question: In dental care, what are the attitudes of dental students regarding biosecurity measures to face the risks of contagion by diseases such as COVID-19?

What is COVID-19?

COVID-19 is an acronym in English for "coronavirus disease 2019". This disease is caused by a virus called SARS-CoV-2, named as such due to its similarity to the virus that caused the SARS (SARS-CoV) outbreak in 2002-2003.[5]

Spread can occur through direct means such as the inhalation of micro droplets and aerosols which are released when speaking, breathing, coughing or sneezing, or by indirect means that occur when touching contaminated surfaces, followed by the hands touching mucous membranes such as eyes, nose or mouth.[6-7]

Dentists are the health professionals who have the highest risk of transmission and acquiring COVID-19, because many of the routine dental procedures, such as oral prophylaxis, scaling, and surgeries, generate aerosols, which then have the potential to transmit the virus, or contaminate surfaces.[8]

Another factor that increases the risk of contagion is the closeness that exists between the dentist and the patient during care and therefore the constant exposure to body fluids.[9]

When a patient is infected with SARS-CoV-2, and coughs or sneezes, they release the virus contained in saliva droplets, which can be dispersed into aerosols, transforming into what is known as a "bio-aerosol".[10]

This has the potential to remain suspended in the air for a considerable amount of time, so dental health personnel are exposed to possible contagion through direct contact with the conjunctiva of drops or aerosols generated during dental treatment, since this conjunctiva mucosa and the upper respiratory tract are connected through the nasolacrimal duct and share the ACE-2 receptor, to which the SARS-CoV-2 virus binds.[11-13]

As such, it is vitally important to abide by the standard biosafety regulations and those proposed as a result of the SARS-CoV outbreak in 2002-2003 to reduce the risk of transmission of SARS-CoV-2 presently.

The pandemic has exposed serious deficiencies in biosafety governance. To ensure public health, safeguard national security, and maintain longterm national stability, it is essential to incorporate biosecurity measures into the national security system. It has been shown that preventive measures and the application of biosafety measures are necessary to control a pandemic such as COVID-19.[17]

The current review compiled and summarized recommendations from the various sources identified within the five topics relevant to the reopening of dental services, including practice preparation, personal protective equipment, clinical area management, dental procedures, cleaning and disinfection.[14-15]

This is why, in the face of a new infection that is considered highly contagious, it is wise to review previously established infection control procedures, which have shown to have good results.

However, as health care providers, dental staff must be wary of the disease and know how it spreads, how to identify SARS patients, and what practice modifications need to be made to prevent disease transmission. Although SARS is now controlled, it can emerge insidiously, as has been the case with many other coronavirus infections.[18]

General Objective and Specific Objectives

General Objective

- To determine the degree of compliance with the biosafety measures proposed in 2004, post the SARS-CoV outbreak, among 5th and 6th year dentistry students from Chilean universities.

Specific objective

- To identify the level of use of personal protection elements among 5th and 6th year dentistry students.
- To identify which biosafety measures and personal protection elements are less compliant.
- To compare the level of knowledge, compliance and the attitudes concerning biosafety standards among 5th and 6th year dentistry students.

MATERIALS AND METHODS.

The present work corresponds to a study with a quantitative, observational, cross-sectional approach, and a descriptive scope, where *PubMed* was used as a database. Complementary gray literature search

ISSN Print 0719-2460 - **ISSN Online** 0719-2479.

sources were also used, like generic search engines (Google and Google Scholar). In the first stage, 65 papers were collected, of which 18 were used for this research according to the inclusion criteria corresponding to the year of publication (from 2004-2020). The paper entitled "Attitudes and behavior of dental students concerning infection control rules: a study with a 10-year interval" (2009)[19] stands out among the reviewed papers.

The questionnaire to be applied to the target audience of this project was extracted from this paper. Dr. Mauro Henrique Nogueira Guimarães de Abreu, one of the authors of the aforementioned paper, provided the questionnaire.

Since the original language of the document was Portuguese, it had to be translated and then validated by María Celeste Morita, President of ABENO, the Brazilian Association for the Teaching of Dentistry.

[Annex]

The population of this study corresponds to dentistry students currently in their fifth and sixth year at Chilean universities. The invitation to participate will be online and open for these students, estimating a sample of approximately 300. The variables to consider are: sex, age, year of study, and university. Authorization of participation through an informed consent will be carried out, which will be found on the same platform.

The data collection will be obtained online through Google Forms and will be available to be answered during the months of September and October of the year 2020, after which the analysis of the results will be carried out on an Excel template using tables and graphs.

Annex. **Main Study Questionnaire (In Spanish).**

CUMPLIMIENTO DE LAS MEDIDAS DE BIOSEGURIDAD PLANTEADAS EN EL AÑO 2004, POST BROTE DE SARS-COV, EN ESTUDIANTES DE ODONTOLOGÍA

Le pedimos que conteste las siguientes preguntas. No hay respuesta correcta. Si no tiene conocimiento de alguna respuesta, puede escribir "No lo sé". Solo queremos saber qué se ha hecho. No necesita identificarse. La información proporcionada aquí es CONFIDENCIAL.

Sexo:_____ Edad:_____ Curso:_____
Universidad:_____

1- ¿Cuántos pacientes atiende por día? _____

2- A) Se lava las manos con:
( ) jabón común, ¿Cuál?_____
( ) con antiséptico, ¿Cúal?_____

B) Al secarse las manos, utiliza una toalla: ( ) papel ( ) de tela

3- Con respecto al equipo de protección personal:
3.1- Con respecto al uso de guantes:
A- Uso para todos los procedimientos en todos los pacientes.
B- Uso guantes para algunos procedimientos en todos los pacientes.
C- Uso guantes para todos los procedimientos en algunos pacientes.
D- Uso guantes para algunos procedimientos en algunos pacientes.

3.2- Con respecto al uso de gafas (anteojos de protección):
A- Uso gafas para todos los procedimientos en todos los pacientes.
B- Llevo gafas para algunos procedimientos en todos los pacientes.
C- Llevo gafas para todos los procedimientos en algunos pacientes.
D- Llevo gafas para algunos procedimientos en algunos pacientes.

3.3- Con respecto al uso de una mascarilla:
A- Uso una máscara facial para todos los procedimientos en todos los pacientes.
B- Uso una máscara facial para algunos procedimientos en todos los pacientes.
C- Utilizo una máscara facial para todos los procedimientos en algunos pacientes.
D- Utilizo una máscara facial para algunos procedimientos en algunos pacientes.

3.4- Con respecto al uso de batas:
A- Uso un batas para todos los procedimientos en todos los pacientes.
B- Uso un batas para algunos procedimientos en todos los pacientes.
C- Uso un batas para todos los procedimientos en algunos pacientes.
D- Uso un batas para algunos procedimientos en algunos pacientes.

4- ¿Desinfectas las piezas de mano de un paciente a otro? ( ) Sí ( ) No, ¿cómo?_____

5- Antes de reutilizar las fresas dentales, ¿usted?:
( ) Esteriliza ( ) desinfecta ( ) sólo lava

6- ¿Desinfecta la película RX después de procesarla? ( ) Sí ( ) No ¿Cómo?_____

7- ¿Qué método de esterilización utiliza?:
( ) horno, tiempo_____ temperatura_____
( ) autoclave, tiempo____temperatura____presión____

8- En cuanto a la protección de la superficie (reflector, botón de la silla, etc.) usted:
( )Lo protege con material impermeable (como plástico, aluminio)
( ) realiza la descontaminación con una sustancia química.

9: ¿Desecha el material de corte (aguja, cuchilla, etc.) en un recipiente sólido con tapa?
( ) Sí ( ) No ( ) Otro diseño ¿Cuál?_____

10-¿Desinfecta la impresión antes de enviarla al laboratorio?
( ) Sí ( ) No ¿Cómo?_____

11-Desechas los restos de amalgama:
( ) en la basura
( ) en un recipiente con agua
( ) otro ¿Cuál?_____

12- ¿Está inmunizado contra la hepatitis B?
( ) Sí ( ) No

13- ¿Se hizo la prueba anti-VHB después de la vacunación?
( ) Sí ( ) No ( ) No sé sobre esta prueba

¡Gracias por su participación!

EXPECTED OUTCOMES.

To obtain a clear view of student's attitudes towards biosafety measures, identifying those that are being complied with and those that are not. In this way we will be able to demonstrate how well prepared we are as students for an upcoming return to practical activities during the COVID-19 pandemic.

CONCLUSION.

The emergence and resurgence of infectious diseases poses significant public health risks that have continuously haunted human civilization in recent decades.In dental care, the risk of contagion by SARS-CoV-2, the etiologic agent of COVID-19, is significantly increased between patient and operator, due to the characteristics of dental care and procedures.

A balanced and practical approach to global biosecurity can only be achieved by acknowledging the many viewpoints and approaches to biosecurity procedures that are effectively implemented around the world to create a safer place to live, which is why, as students, we must be aware of all these biosecurity measures to protect both our health and the health of the patients.

ISSN Print 0719-2460 - **ISSN Online** 0719-2479.

REFERENCES.

1. B1. Li RW, Leung KW, Sun FC, Samaranayake LP. Severe acute respiratory syndrome (SARS) and the GDP. Part II: implications for GDPs. Br Dent J. 2004;197(3):130-134. Disponible en: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7091810/
2. Li RW, Leung KW, Sun FC, Samaranayake LP. Severe acute respiratory syndrome (SARS) and the GDP. Part II: implications for GDPs. Br Dent J. 2004 Aug 14;197(3):130-4. doi: 10.1038/sj.bdj.4811522. PMID: 15311240; PMCID: PMC7091810.
3. Organización Mundial de la Salud(WHO). Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. Ginebra: WHO; 2020 Disponible en: https://www.who.int/es/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020
4. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. J Dent Res. 2020 May;99(5):481-487. doi: 10.1177/0022034520914246. PMID: 32162995; PMCID: PMC7140973.
5. Cascella M, Rajnik M, Aleem A, Dulebohn SC, Di Napoli R. Features, Evaluation, and Treatment of Coronavirus (COVID-19). 2022. Treasure Island (FL): StatPearls Publishing. PMID: 32150360.
6. Lotfi M, Hamblin MR, Rezaei N. COVID-19: Transmission, prevention, and potential therapeutic opportunities. Clin Chim Acta. 2020 Sep;508:254-266. doi: 10.1016/j.cca.2020.05.044. PMID: 32474009; PMCID: PMC7256510.
7. Organización Mundial de la Salud (WHO). Coronavirus disease (COVID-19): How is it transmitted? Ginebra. 2020. Disponible en: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-how-is-covid-19-transmitted
8. Dar Odeh N, Babkair H, Abu-Hammad S, Borzangy S, Abu-Hammad A, Abu-Hammad O. COVID-19: Present and Future Challenges for Dental Practice. Int. J. Environ. Res. Public Health. 2020; 17(9):3151.
9. Martínez-Camus DC, Yévenes-Huaiquinao SR. Atención Dental Durante la Pandemia COVID-19. Int. J. Odontostomat. 2020;14(3):288-95. doi./10.4067/S0718-381X2020000300288.
10. Ge ZY, Yang LM, Xia JJ, Fu XH, Zhang YZ. Possible aerosol transmission of COVID-19 and special precautions in dentistry. J Zhejiang Univ Sci B. 2020 May;21(5):361-368. doi: 10.1631/jzus.B2010010. PMID: 32425001; PMCID: PMC7089481.
11. Odeh ND, Babkair H, Abu-Hammad S, Borzangy S, Abu-Hammad A, Abu-Hammad O. COVID-19: Present and Future Challenges for Dental Practice. Int J Environ Res Public Health. 2020 Apr 30;17(9):3151. doi: 10.3390/ijerph17093151. PMID: 32366034; PMCID: PMC7246705.
12. Liu Z, Xiao X, Wei X, Li J, Yang J, Tan H, Zhu J, Zhang Q, Wu J, Liu L. Composition and divergence of coronavirus spike proteins and host ACE2 receptors predict potential intermediate hosts of SARS-CoV-2. J Med Virol. 2020 Jun;92(6):595-601. doi: 10.1002/jmv.25726. PMID: 32100877; PMCID: PMC7228221.
13. Baghizadeh Fini M. What dentists need to know about COVID-19. Oral Oncol. 2020 Jun;105:104741. doi: 10.1016/j.oraloncology.2020.104741. PMID: 32380453; PMCID: PMC7186204.
14. Barabari P, Moharamzadeh K. Novel Coronavirus (COVID-19) and Dentistry-A Comprehensive Review of Literature. Dent J (Basel). 2020 May 21;8(2):53. doi: 10.3390/dj8020053. PMID: 32455612; PMCID: PMC7345990.
15. Umer F. Ancillary considerations for endodontic emergency treatment of Covid-19 positive patients. Spec Care Dentist. 2020 Jul;40(4):395-396. doi: 10.1111/scd.12484. Epub 2020 Jun 5. PMID: 32501576; PMCID: PMC7300585.
16. Ağalar C, Öztürk Engin D. Protective measures for COVID-19 for healthcare providers and laboratory personnel. Turk J Med Sci. 2020 Apr 21;50(SI-1):578-584. doi: 10.3906/sag-2004-132. PMID: 32299205; PMCID: PMC7195977.
17. Almofada S K, Alherbisch R J, Almuhraj N A, et al. (June 29, 2020) Knowledge, Attitudes, and Practices Toward COVID-19 in a Saudi Arabian Population: A Cross-Sectional Study. Cureus 12(6): e8905. doi:10.7759/cureus.8905
18. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. J Dent Res. 2020 May;99(5):481-487. doi: 10.1177/0022034520914246. PMID: 32162995; PMCID: PMC7140973.
19. Abreu MH, Lopes-Terra MC, Braz LF, Rímulo AL, Paiva SM, Pordeus IA. Attitudes and behavior of dental students concerning infection control rules: a study with a10-year interval. Braz Dent J. 2009;20(3):221-5. doi: 10.1590/s0103-64402009000300009. PMID: 19784468.